

THE LEARDO MAP
OF THE WORLD

1452 OR 1453

JOHN KIRTLAND WRIGHT



AMERICAN GEOGRAPHICAL SOCIETY

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THE LEARDO MAP OF THE WORLD
1452 OR 1453

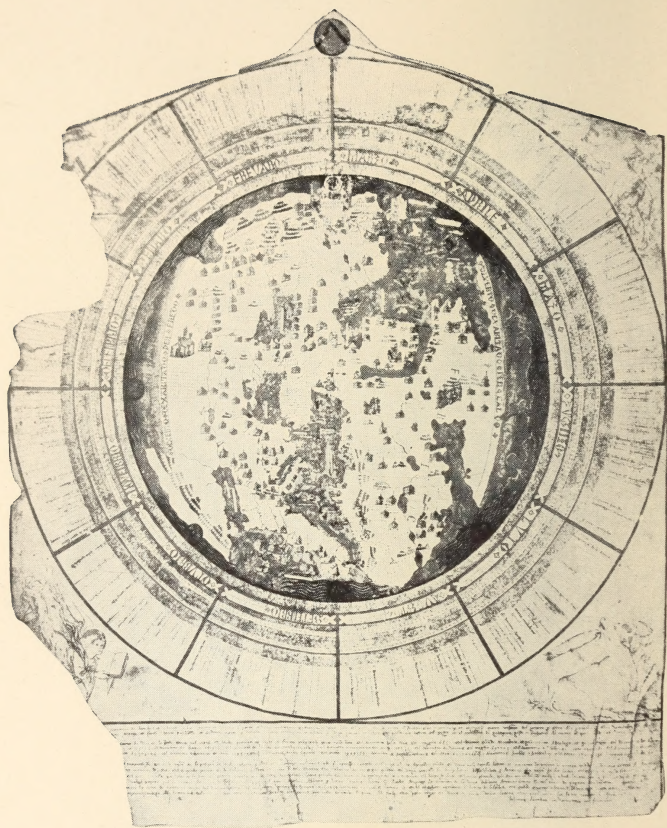


FIG. 1—The Leardo Map of the World, 1452 or 1453.

AMERICAN GEOGRAPHICAL SOCIETY

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THE LEARDO MAP OF THE WORLD

1452 OR 1453

*In the Collections of the
American Geographical Society*

BY

JOHN KIRTLAND WRIGHT, Ph.D.

Librarian, American Geographical Society

WITH A NOTE ON THE REPRODUCTION OF THE MAP

BY

A. B. HOEN



AMERICAN GEOGRAPHICAL SOCIETY

BROADWAY AT 156TH STREET

NEW YORK

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CONTENTS

	PAGE
THE LEARDO MAP OF THE WORLD, 1452 OR 1453	1
The Calendar and the Inscription Beneath It	2
The Map Disk	4
Sources of Leardo's Geography	6
The Known World According to Leardo	10
Asia	10
Africa	15
The Mediterranean	16
Europe	17
NOTES	21
APPENDIX: DETAILED COMMENTS ON THE MAP	31
Explanation	31
I. Northern Asia	32
II. Far Eastern Asia	35
III. India	37
IV. Central Asia	40
V. Persia	41
VI. Mesopotamia and Syria	42
VII. Arabia	44
VIII. Asia Minor	45
IX. Armenia, Caucasia, and Southeastern Russia	46
X. Indian Ocean, Persian Gulf, and Red Sea	47
XI. Southern Africa	47
XII. Middle and Lower Nile Region	49
XIII. Upper Nile Region and West Africa	50
XIV. North Africa	52
XV. Black and Mediterranean Seas	54
XVI. Southwestern Europe	55
XVII. Atlantic Ocean and Islands	56
XVIII. Central Europe	56
XIX. Italy	57

APPENDIX (*continued*)

XX. Southeastern Europe	57
XXI. Baltic Sea	58
XXII. Scandinavia	58
XXIII. Eastern Europe	59
XXIV. Far North	60
LIST OF REFERENCES	63
THE REPRODUCTION OF THE LEARDO MAP, by A. B. Hoen .	71

ADDITIONS AND CORRECTIONS

Dom H. G. Bévenot of Weingarten Abbey, Württemberg, Germany, has called the writer's attention to the fact that in the cathedral of Munster in Westphalia there is a large astronomical clock. Beneath this there "is a square glass case with a large circular diagram on which the months of the year, saints' days, and astronomical data are arranged in concentric circles just as on Leardo's figure."

P. 26, note 11. Dom Bévenot also points out that the division of the hour into 1080 parts is in accordance with an old Jewish practice and is discussed in Eduard Mahler, *Handbuch der jüdischen Chronologie*, Leipzig, 1916, pp. 17, 20-24.

To Dr. E. L. Stevenson the writer is indebted for the following corrections:

P. 28, note 22. The date of the Genoese World Map is 1457, *not* 1447. See Edward Luther Stevenson, *The Genoese World Map, 1457. Facsimile and critical text incorporating in free translation the studies of Professor Theobald Fischer revised with the addition of copious notes.* (Hispanic Society Publication No. 83) New York, American Geographical Society, Hispanic Society of America, 1912, pp. 1, 10.

P. 65, lines 19-20. Fra Mauro's map of the world is now in the Library of St. Mark's, Venice, *not* in the Doge's Palace.

P. 9, line 6. The Este map should perhaps be dated earlier than 1450. "The librarian of the Este Library considers that the writing of the Este Map is of the end of the fourteenth century." A. R. Hinks, *The Portolan Chart of Angellino de Dalorto, MCCCXXV*, London, Royal Geographical Society, 1929, p. 8.

P. 21, note 2. A colored reproduction of Leardo's map of 1448 appears in *Viaggi in Persia, India e Giava di Nicolò de'Conti*, edited by Mario Longhena, Milan, 1929, p. 40.

Appendix, pp. 35-40. In a review in *Zeitschr. der Gesellschaft für Erdkunde zu Berlin*, 1930, No. 5-6, p. 228, Dr. Albert Herrmann suggests the following changes and identifications: No. 37. Tenduc lies in the northern part of the great bend of the Hwang Ho. No. 42. Asmiraei montes are not the Eastern Tien Shan but the Chinese Tsi-shih, the apparent source of the Hwang Ho. No. 44. Tagurus = Richthofen Rangé. No. 47. anibi = the whole Tien Shan. No. 48. Tanacomedo, montes Comedarum, are not in Sogdiana but in Karategin (upper Oxus region). No. 49. Oechardes = Tarim and Hwang Ho. No. 87. Zayton = Ts'üan-chou (Fukien). No. 130. Massagetæ = nomadic people between the Caspian Sea and the Jaxartes.

ILLUSTRATIONS

FIG.	PAGE
1. The Leardo map of the world, 1452 or 1453 . . .	<i>frontispiece</i>
2. Passage from mid-eighteenth century manuscript of the Doge Marco Foscarini referring to Leardo map of 1447	23
3. Passage from mid-eighteenth century manuscript of Giovanni Agostini referring to Leardo map of 1447 . . .	23
4. General key map	<i>at end of book</i>
5. Detailed key map; northeastern section . . .	<i>at end of book</i>
6. Detailed key map; east-central section . . .	<i>at end of book</i>
7. Detailed key map; southeastern section . . .	<i>at end of book</i>
8. Detailed key map; northwestern section . . .	<i>at end of book</i>
9. Detailed key map; west-central section . . .	<i>at end of book</i>
10. Detailed key map; southwestern section . . .	<i>at end of book</i>

THE LEARDO MAP OF THE WORLD 1452 OR 1453

In 1906 Archer M. Huntington, Esq., presented to the American Geographical Society one of three known maps of the world signed and dated by the Venetian, Giovanni Leardo. Of these, the oldest, as well as the crudest and simplest, is preserved in the Communal Library at Verona and carries the date 1442.¹ The second (1448), somewhat more elaborate in design, belongs to the Civic Museum at Vicenza.² The Society's map,³ the largest of the three, bears the signature in the lower right-hand corner: *Johanes Leardus de Venetteis me fezit abano domini 145[?]*. The last digit in this inscription is partly mutilated; the date, however, is probably either 1452 or 1453.⁴

The Society's map is of primary interest as revealing a conception of the earth's surface typical of the century preceding the discovery of America. In its blending of colors and pleasing general composition it forms a work of art of no slight decorative value. Furthermore, the encircling calendar and many details on the map proper are distinctly unusual.⁵ The Society has therefore undertaken the publication of a full-sized colored facsimile, in explanation of which the present book was prepared. Drawn on a piece of parchment measuring 28½ by 23¾ inches (72.4 x 59.4 cm.), the original is in a fair state of preservation except for two pieces torn from the left-hand side, for discolorations, and for the fading

¹ The notes will be found on pp. 21-28.

of some of the inscriptions. Fortunately, no part of the map itself has been seriously injured.

THE CALENDAR AND THE INSCRIPTION BENEATH IT

The calendars encircling Leardo's three maps constitute exceptional additions. Of these calendars, the one on the Society's map is the most interesting. The inscription in the panel below the circles, in part an explanation of the calendar, is somewhat awkwardly phrased in the Venetian dialect of the fifteenth century, but, although it lacks the beginning of each line, the meaning is fairly clear, especially when certain of the missing lines are reconstructed from the corresponding inscription on the map in Vicenza.⁶

In the first two lines the cartographer makes an excursion into the realm of theology. According to Dr. Arthur C. McGiffert, to whom the present writer submitted the passage, this part of the inscription is "evidently not the work of a theologian, for it makes God the creator 'of all things created and *uncreated*' (the credal phrase is 'things visible and invisible'), and in the next clause runs the Trinity ('three persons and one common substance') and the person of Christ together as if they were the same thing. There are reminiscences of the Nicene creed, but the whole is theologically a hodge-podge."

This passage is followed by a statement that the map shows how the land and islands stand in relation to the seas and how the many provinces and mountains and principal rivers are distributed

on the land. Then, on the asserted authority of Macrobius, "a very excellent astrologer and geome-trician," figures are given for the dimensions of the earth and of various heavenly bodies. These are quite fanciful, bearing little relation to the corre-sponding figures actually cited by Macrobius.⁷

The astronomical details are followed in the third paragraph by the explanation of the calendar. The latter consists of eight concentric circles, of which the innermost gives the dates of Easter for ninety-five years, from April 1, 1453, to April 10, 1547; when Easter falls in April, *A* is written in the small compartment, when in March, *M*; leap years are designated by *B* ("bissextile years").

The second circle shows the names of the months, beginning with March, which was officially reckoned the first month of the year in the Republic of Venice until as late as 1797⁸; it also tells the day, hour, and minute when the sun enters each of the twelve signs of the zodiac.

The third, fourth, fifth, and sixth circles enable one to calculate the phases of the moon. In the third circle the first nineteen letters of the alphabet represent in order the years of the Metonic lunisolar cycle. These years were usually designated by the golden numbers, but before the Gregorian reform letters were frequently employed in place of the numbers. Leardo explains that *C* stands for 1453, *D* for 1454, and so on until *T* is reached, after which we begin over again at *A*.⁹ A letter is placed opposite the figures (in the fourth, fifth, and sixth

circles) showing respectively the day of the month, the hour of the day, and the "point of the hour" at which the "conjunction of the moon" (i. e. new moon) will take place in the years to which the letter refers. For example, there will be a new moon on April 8, 1453, at 16 hours, 200 points.¹⁰ Leardo adds that there are 1080 points in an hour.¹¹

The seventh circle gives the dominical, or "Sunday," letters; these are indicated opposite the days of the month (fourth circle) on which Sunday falls in the years designated by the seven first letters of the alphabet. If we know the dominical letter for any particular year, we may thus determine the days of the week.¹² Leardo, however, does not specify the years to which the dominical letters in his calendar refer.

The eighth and ninth circles give the lengths of the days in hours and minutes.¹³ From this we see that the vernal equinox fell on March 11, inasmuch as the calendar was constructed before the Gregorian reform. Finally, in the tenth circle saints' days and other religious festivals are shown.¹⁴

The four figures in the spaces between the calendar and the outer edge of the parchment represent the four evangelists: the lion for St. Mark, the bull for St. Luke, the angel for St. Matthew, and the eagle (of which only the head shows) for St. John.¹⁵

THE MAP DISK

It should be noted first that east is at the top of the map and Jerusalem at the center; hence the long

axis of the Mediterranean runs vertically up the southern half of the disk.

With the exception of the Red Sea, appropriately colored, the seas are uniformly blue. The lands are left the natural color of the bleached parchment except for a fiery red region in the far south bearing the legend: "Desert uninhabited because of heat," and a dreary brown waste in the far north marked: "Desert uninhabited because of cold." Islands are tinted either red or yellow, with green patches in the interior of Great Britain and Ireland. The only other natural features depicted are mountains, rivers, and lakes, although certain deserts are mentioned in legends. Mountain ranges are represented by rows of mounds, alternately red, green, and blue, and each rising symmetrically in two or three steps. Rivers are blue and, as frequently on medieval maps, sometimes connect one sea with another, or at least have common sources. A yellow lake, labeled "Sandy Sea," lies in the midst of the Sahara.

Vignettes of castles, walled towns, and churches stand for cities, kingdoms, and regions. In most cases the names have been written upon the vignettes themselves; since the latter are also colored pink or green, the letters are frequently obscured and quite illegible. Many towns and districts are shown by red dots beside which the names are written in ink, once black but now faded with age. These names were inserted after the vignettes were drawn, for in many instances they are tilted or com-

pressed to fit the available space. The draftsman did not venture to write any name to the left of the dot to which it belongs; as he could not write on the blue of the seas, he was obliged to invert the map in the case of places on south-facing coasts. Names of islands and seas, which had to be written on water surfaces, are inclosed in small yellow panels. The names of the continents, the two inscriptions relating to the polar and equatorial deserts, and the words "Terrestrial Paradise" are in red capitals; but all other names are in minuscule, usually without an initial capital. Besides place names there are a few longer legends.

Winds blowing from the four cardinal and four intermediate points of the compass are shown by eight faces around the edge of the disk. Those to the north, northwest, and northeast are blue, suggesting cold blasts from these quarters; the other faces are ruddy.

Although decorative, the Leardo map lacks many of the pictorial elements—animals, birds, preposterous monsters—that enliven the blank spaces on other medieval maps. With the exception of the eight wind faces and the symbolic figures of the evangelists no living creatures, whether animals or men, are graphically represented.

SOURCES OF LEARDO'S GEOGRAPHY

Briefly stated, the sources of Leardo's geography are to be sought in the information accumulated by the Greeks and Romans, as added to and altered

during the early Middle Ages by the Church Fathers on the basis of the interpretation of the Bible and as later augmented by the work of medieval travelers, merchants, and sailors.

At a very early period the Greeks developed the idea (borrowed, perhaps, from the Babylonians¹⁶) that the earth is a flat disk surrounded by the Ocean Stream. This conception seems to have given rise to a cartographic tradition followed by certain ancient and medieval map-makers who had long outgrown the belief that the earth is actually flat. Thus Leardo draws a circular land mass, or *oikoumene*, surrounded by a narrow hem of water. We cannot, however, question his belief in the sphericity of the earth, for otherwise he could hardly have held the views expressed in the panel below the calendar. Furthermore, his two legends relating to the fiery and frozen deserts echo a theory that was propounded in classical times and based on the hypothesis of a spherical earth. This theory, worked out in detail by Crates of Mallos, is briefly as follows.¹⁷ Around the equatorial circumference of the globe is a fiery zone so intensely hot that no man can cross it. This zone cuts off all communication with the southern hemisphere. The north and south polar caps are uninhabitable because of the cold. An ocean encircling the globe from north to south intercepts communication with the half of the northern hemisphere opposite the *oikoumene*. Many maps were made in the Middle Ages to illustrate this conception. Leardo presumably had it in mind

and did not intend to represent either a flat disk or a complete hemisphere but merely a circular portion of the earth's surface lying north of the equator.

In its orientation, with east and the Terrestrial Paradise at the top and with Jerusalem at the center, the map follows the Christian tradition of the earlier Middle Ages. Other features reflecting the influence of the Scriptures are Noah's Ark resting on top of Mt. Ararat, Mt. Sinai, the exaggerated length of the River Jordan, and an inscription in the far northeast referring to Gog and Magog.

Later medieval contacts between Europe and remote lands are revealed in names derived from Marco Polo and possibly from other Western travelers who had visited the Orient, as well as in the Arabic names in Asia and Africa.

Medieval navigators' charts also influenced Leardo. Towards the close of the thirteenth century sailors in the Mediterranean—particularly Italians and Catalans—began making marine maps (known as portolan charts) that far surpassed all earlier maps in the accurate delineation of coast lines. The majority of these show the Mediterranean and Atlantic coasts of Europe and of north Africa but little of the interior of the continents and nothing of the farther parts of Asia. Some, however, were used as the basis for maps of the world. On the latter the shore lines were derived from the navigators' charts, and the remaining regions were compiled from other sources. The Leardo map belongs in this category.

Among the existing maps dating from the fourteenth and early fifteenth centuries our Leardo map is very closely related to the group of maps drawn by the famous Catalan cartographers of Majorca in the Balearic Islands. In its general outlines it is so strikingly like a Catalan map of about 1450 now preserved in the Este Library at Modena¹⁸ that we must assume a common cartographic ancestor at no great distance back. There are, however, certain legends on the Este map that Leardo does not give, particularly the long inscriptions and a multitude of place names on the Mediterranean and Atlantic coasts. Leardo's map, on the other hand, has features not shown on the Este map. These are of two sorts: (1) place names in Asia and Africa, the counterparts of which may be found on other Catalan¹⁹ and Italian²⁰ maps of the period; and (2) river, mountain, and province names taken directly from Ptolemy. There are also not a few names whose origins or counterparts on other maps I have been unable to trace.

Ptolemy's *Geography* had been neglected during the earlier Middle Ages, but the enthusiastic interest in Greek literature which characterized the early Renaissance had led to its translation into Latin shortly before Leardo's time.²¹ A strict interpretation of Ptolemy's data would have necessitated a complete redrafting of the outlines of the continents, as was done on the Ptolemaic atlases of the mid- and late fifteenth century. Leardo made no such attempt. The extent of his concession to the

Ptolemaic geography was to sprinkle a few of Ptolemy's names over a medieval base and to add the Rivers Indus and Oecharides in eastern Asia.²²

THE KNOWN WORLD ACCORDING TO LEARDO

In the Appendix (pp. 31-67) I have tried to identify as many as possible of the names and other features shown on the Leandro map with existing places, or at least with corresponding features on other maps of the period. Here I propose to conduct the reader on a rapid sight-seeing tour around the map, pointing out some of the most interesting details only.

Asia

In the extreme north (left-hand side) there is a large structure which looks like an Italian church with its campanile(13).^{*} The legend beneath, suggested ultimately by a passage from Marco Polo, runs about thus: "[This is] the sepulcher of the [Grand Khan] and they do this when he comes to be carried for interment: he comes accompanied by many armed men who kill those whom they find on the roads, and they say that the souls of these are blessed because they accompany the soul of the Grand Khan to another life." Marco Polo adds that at the time of the funeral of Mangou Khan 20,000 persons were thus slain! The actual place of burial of the Mongol Khans was in Cathay, far away from northern Russia where Leandro, following

^{*}The numbers in parentheses correspond to the reference numbers in the Appendix (pp. 32-60) and on the key maps at the end of the book.

the model of Catalan maps, draws it. European cartographers of the fourteenth and fifteenth centuries seem to have known and cared little about the relative positions of places in Asia; as Italian merchants by this time had established contacts with the Mongols in southern Russia, what was more natural than to place the Mongol overlord's tomb in the hinterland of the Black Sea? Here there was more available space than in the Far East, and here on Leandro's map the Grand Khan's tomb could be made symmetrically to balance Prester John's palace across the map in Africa (299).

South of the sepulcher we see the River Volga (6, 7) flowing into the northwestern corner of the Caspian (250). A branch from the east (8), perhaps the Kama, joins the Volga where the latter bends at a right angle to the south. East of the lower Volga is a "desert of thirty days" (10), Polo's mysterious demon-haunted desert of Lop, where the traveler hears ringing bells and other uncanny sounds (possibly "singing sands"). Like the Grand Khan's tomb, this desert is also wofully misplaced, since the actual desert of Lop lies in eastern Chinese Turkestan. The responsibility is not Leandro's, however, for the Lop desert is in the same place on the Catalan Atlas of 1375 and on the Este map.

Farther east, beyond a row of six castles representing towns on the borderlands of China (35-40), we come to a gulf of the encircling ocean and to a great system of mountains. The gulf (11), which

contains three islands, appears in almost the same position and form on the Este map, where there is a legend explaining that on the islands griffons and falcons are found and that the natives are not allowed to kill them without the permission of the Grand Khan of the Tatars. This is also from Marco Polo, who writes that the islands where the gerfalcons are bred lie so far north that the North Star is left behind you in the south! The mountains southeast of the gulf make an enclosure shaped something like a θ (42-47). Inside the northern half of this θ a legend tells us that "this is the province of Gog and Magog, where many tribes of the Jews were shut in" (70), referring to the medieval tradition that Alexander the Great enclosed Gog and Magog—the terrible hordes of Antichrist—within the Caspian Mountains. On many maps the mountains of Gog and Magog in the Far East are named thus. Leardo, however, places "M^o Gaspio" (Caspiae Montes) (4) north of the Caspian Sea somewhat nearer the position at which Ptolemy had placed them. To the mountains of Gog and Magog he assigns names derived from Ptolemy's northeastern Asia. Running westward from the southern basin formed by these mountains Leardo has added a river (49), the Oechardes of Ptolemy. Near the point where this river emerges from the mountain rim we see a red spot labeled "Iron gate" (72) and, immediately to the west, two short red marks, "Statues of Alexander" (73). The iron gate was built by Alexander in the wall en-

closing Gog and Magog, and the statues represent trumpeters set up by Alexander to keep guard over these unclean hordes. On the Catalan maps the trumpeters themselves are shown with their trumpets.

Immediately west of the statues appears "Mount Tanacomedo" (48), an amusing instance of Leardo's carelessness; he has here evidently copied "Montana Comedorum" from a Ptolemaic map, combining the last part of the first word with the first part of the last! At the extreme eastern edge of the world disk we see the Terrestrial Paradise (63) surrounded by an enormous wall to keep out curious intruders. The River Indus flows southwestward to a great delta near the entrance of the Persian Gulf (84). Many of the place names in India correspond with those of the Catalan maps and in turn were derived from Marco Polo. The scene of St. Thomas' mission and of the early introduction of Christianity into India is indicated by the inscription: "Here preached St. Thomas "(113).

In central Asia, we note two rivers entering the eastern side of the Caspian Sea, the Jaxartes (117) and Oxus (118). The Lake of Aral, in which these great streams actually have their outlet, seems to have been wholly unknown to the geographers both of antiquity and of medieval Europe. Moslem scholars, however, were aware of its existence. Leardo's castles of Organa and of Organzia (Urganj) (120, 121) at the mouth of the Jaxartes and his place name Orcania (132) on the Oxus recall

Matthew Arnold's description of the Oxus at the close of *Sohrab and Rustum*:

But the majestic river floated on . . .
Right for the polar star, past Orgunjè,
Brimming, and bright, and large.

The Tigris and Euphrates (165, 166) join, reaching the Persian Gulf (267) as a single stream flowing between two large edifices that represent Susiana (172) and Babylonia (173). To the east of the Tigris a nameless river (139) having its headwaters in a large lake (138) also enters the Persian Gulf. This same stream on the Catalan Atlas and on the Este map rises in a double source, two bodies of water that have been identified with Lakes Van and Urmia. Leardo connects the Euphrates (166) with the Mediterranean through the Orontes (168) and with the Red Sea (268) through the Jordan (167).

The most prominent feature in Arabia is Mecca (211), a large domed and towered building in good Italian Renaissance style and presumably representing a mosque. Several corrupted Turkish place names (227, 228, 229, 232) along with classical names (224, 231, 233-235) appear in Asia Minor.

The Indian Ocean is filled with yellow and red islands. A legend asserting that pepper and spice are found in these islands (275) comes from Marco Polo's description of the East Indian archipelago. The largest of all the islands, lying off the coast of India, is marked Taprobana (269) and probably represents Sumatra.

Africa

Leardo's Africa, like that of the Este map, has a very unusual shape. Two gulfs reach inland from the Indian Ocean and from the Atlantic, partially cutting off the southern extremity of the continent. On the Este map the eastern gulf is not as prominent as that of Leardo's map, but the western is even deeper. Kretschmer suggests that these features have sprung from a combination of the ancient doctrine of a vast austral continent with Ptolemy's theory that the Indian Ocean is surrounded by land.²³ Certain Arabic maps show an eastward projection of Africa like those of the Este map and Leardo, although they do not indicate anything corresponding to the western gulf.

Prester John's castle (299) bulks large in the interior of Africa. In the twelfth century, reports spread through Europe of the vast realm of a fabulous Christian monarch in the heart of Asia. By the fourteenth century, however, Prester John's empire had been transferred to Africa, where it became associated with the Christian kingdom of Abyssinia. The elaborate edifice with which Leardo represents Prester John's empire may be intended for the sumptuous palace described in the thirteenth-century *Letter of Prester John*.

Like most medieval cartographers, Leardo makes the Nile (312) rise in West Africa (338). In this he follows Herodotus, Pliny, Mela, and other ancient authorities. Ptolemy, however, seems to have had

a more correct view, placing the sources of the river in the Mountains of the Moon in eastern Africa. Nothing daunted, most of the fifteenth-century cartographers who used the writings of Ptolemy boldly transferred the Mountains of the Moon to West Africa to suit their theory of the river's course. Thus, on the Leardo map we see the Montes Lunae (334) on the north coast of the West African gulf. Thence four streams flow north into a lake, out of which the Nile makes its way eastward and another stream flows westward into the Atlantic. The latter stream represents, perhaps, a combination of Niger and Senegal, of which some faint knowledge may have been gained through traders who had crossed the Sahara. The lower Nile is joined by the River "Stapus" (313), doubtless the Astapus of Ptolemy or the modern Blue Nile. On the Este map this tributary rises in the Terrestrial Paradise, there placed in East Africa.

To the mountain range of North Africa, the Carena of the Catalan maps, Leardo has added Ptolemaic names (385-392).

The Mediterranean

The outlines of the Mediterranean (433) and Black Seas (431) are more correct than any other features which Leardo draws. This, of course, is due to the fact that they were derived ultimately from the portolan charts. Leardo preserves the faulty orientation of the Mediterranean characteristic of the latter. If we assume that the perpen-

dicular line extending from the wind-blower off the west coast of Spain through Jerusalem to the wind-blower east of the Terrestrial Paradise is intended to run due east and west, we see that the axis of the Mediterranean with the adjoining shores has been turned counter-clockwise some twelve degrees. This is probably because of failure on the part of the makers of the original portolan charts to take into consideration the declination of the compass.²⁴

Leardo's place names along the Mediterranean and Black Sea coasts are all derived from the portolan charts, although Leardo wrote names only where it was easy to do so without crowding. The least successful portion of Leardo's Mediterranean coast is that of Spain: the shore is here unduly elongated as compared with that of the Este Catalan map, Barcelona (475) and Ampurias (476) being placed too far northeast on what ought to be the French shore line.

Europe

As on the Catalan maps, the geography of north-western Europe is badly distorted. The Seine (448), Rhine (487), and Elbe (488) all flow parallel with one another but slightly to the south of west. The course of the Danube (552) with its southern branches is more true to nature. The Baltic Sea (577) and Scandinavia are drawn much as on the Este map.

NOTES

NOTES

¹ Giuseppe Crivellari, *Alcuni cimeli della cartografia medievale esistenti a Verona*, Florence, 1903, pp. 5-28.

² This map was discovered by Vincenzo Lazari in 1850. A detailed description and interpretation of it will be found in Santarem, Vol. 3, pp. 398-442 [fuller bibliographical details regarding this and other abbreviated references in these notes will be found on pp. 63-67]; black and white reproduction in Santarem's *Atlas*, Part 3, No. 49; also in A. E. Nordenskiöld, *Periplus*, p. 61.

³ The map was discovered in 1879 by Major Friedrich von Pilat, Imperial Counsellor of the Austro-Hungarian Legation and Consul-General of Austria-Hungary in Venice. At the time it was presented to the Society a brief anonymous description appeared in the *Bulletin of the American Geographical Society*, Vol. 38, 1906, pp. 365-368. This was based upon a sixteen-page pamphlet by Dr. Guglielmo Berchet, *Il planisfero di Giovanni Leardo dell' anno 1452*, Venice, 1880, accompanying a photographic facsimile constituting No. XIV of the series *Raccolta di mappamondi e carte nautiche del XIII al XVI secolo* published by Ferdinand Ongania, Venice. Dr. Berchet's paper, while useful to the present writer, has on the whole proved disappointing because of its many inaccuracies in transcriptions and also because almost no attempt was made to deal with the place names, in many respects the most interesting features of all.

⁴ As much of this digit as remains might be the upper part of either a 2, a 3, or a 7. Since the Easter calendar begins with 1453 the date could hardly be earlier than Easter, 1452. For the same reason, it is not likely to have been as late as 1457, the only possible date after 1453. On the Vicenza Leardo map the Easter calendar begins with the year in which the map is dated, 1448; on the Verona map of 1442 the calendar begins with the preceding year, 1441. A discrepancy of four years between the beginning of the calendar and the date of the map, however, is most improbable.

Santarem, Vol. 3, p. 399, and Berchet, *op. cit.*, p. 6, cite two mid-eighteenth century MSS in the Library of St. Mark's, Venice, which contain entries relating to a map by Giovanni Leardo dated 1447. One of these MS is that of the Doge Marco Foscarini (Codex ital., XI, 123, p. 42), the other that of a contemporary scholar, Giovanni degli Agostini (Codex ital., VII, 291, p. 542; this and the preceding reference were furnished to the present writer by the Chief Librarian of the Library of St. Mark's; they do not agree exactly with the references as given by Santarem and Berchet).

The passage from the Foscarini MS (Fig. 2) may be translated thus: "Gio. Leardo, who flourished in 1440, made a planisphere on parchment on which was written *Leardius de Venetiis me fecit anno 1447*. It was at the house of (*era presso*) Bernardo Trevisano. Apostolo Zeno saw it many times and marveled at seeing the exactness of the design." The passage from the Agostini MS (Fig. 3) runs as follows: "Giovanni Leardo: This (man) lived shortly before the middle of the fifteenth century, and he delighted in geography and spheres. In the Trevisan Library was preserved a planisphere by him on parchment on which could be seen delineated the whole terraqueous globe with all the signs and celestial constellations, beneath which, according to his assertion, every part is placed. At the bottom of this parchment these words may be read: *Joannes Leardius de Venetiis me fecit ab anno 1447*. It is curious to see how in his time, when not many discoveries had been made and navigation was so little advanced, the positions of the provinces and of the seas were conceived."

Berchet, *op. cit.*, p. 7, points out that the arms at the top of the parchment of the Leardo map now belonging to the American Geographical Society are those of the Trevisan house. He reads incorrectly, however, the date given by Agostini as 1452, concluding therefrom that the map mentioned by the latter was the same as the Society's map, the date of which he also reads as 1452. In view of the actual difference in the dates, we may conclude that Leardo constructed two maps for the Trevisan family, and that the one dated 1447 is yet to be rediscovered.

Dell' origine del Nilo vivere il gran Sen.^{re} Domenico
 Livigiano che viaggio in Gitta. V. Epistafio superius.
 - Tavola di vivere lo cost di Barbaria. V. Pag: 83
 e seguenti. Detcrive anche L' Egitto. Ibid:
 Gio: quando il quale fioriva nel 1440 formo un pla-
 nificio in carta picola ove era scritto Cardius
 de Venetis me fecit anno 1447. Era pierro
 Bertrando Livigiano. Apostolo Zeno più volte
 il vidi, e vi meraviglio in vederlo esser.^{te} L' linato.
 Paolo Marsini nell' Tot.^{te} Pag: 233 dice che li

FIG. 2

541
 Giovanni Leardo. Pien ogni po più bello neta del
 stato. e si detto di. Siogefo e di. Nello
 Cielo Dividend compendiar una spheria de cui
 in carta picola, ove si vedeva delineato tutto el globo
 nuovo, con intorno a ogni e le congregazioni de-
 legi alle quali giugno, lo sp. de venetia ogni parte
 e compo. In parte di questo carta si leggono
 queste parole. Possey & Leardo de venetia me fecit
 al anno 1447. Egl' e questo el vedea come el no
 tempo in cui non si facea tanti viaggiamenti, e si
 po e ved mandare lo navigatore, si vedea lo
 situazione delle provincie, e li mari.

FIG. 3

FIGS. 2 and 3—Passages from mid-eighteenth century manuscripts in the
 Library of St. Mark's, Venice, in which reference is made to a map by
 Giovanni Leardo, dated 1447. Fig. 2 from manuscript of the Doge Marco
 Foscarini; Fig. 3 from manuscript of Giovanni Agostini. See note 4.

⁵ Although the Society's map is not, perhaps, one of the great, outstanding monuments of medieval cartography, the assertion of Theobald Fischer (*Sammlung mittelalterlicher Welt- und Seekarten*, Venice, 1886, p. 104) that the Leardo maps of 1448 and 1452 were "von geringem Wert," seems too harsh.

⁶ There follows a transcription of this legend. Missing passages supplied from the Vicenza map as transcribed on Santarem's reproduction are given in square brackets:

. *chreatore de Tute le Cose chreate et non chreato et E En 3 persone et una medexima sustanzia et uno Idio El quale En .i. inita (divinita?) E Incomprensibelle aiomeni et aianzelli quanti uisono dal zentro per sino Ala zirconferenzia En umanita . . . | ene Maria et farsi homo pasibelle et sostener morte per Redimer Lumana zenerazione et resusito Il Terzo zorno et asexe . . . (en?) ziello ala dextera del padre et al nouissimo di zudigera zusti et pechatori. Al nome de quel dio che cosi veramente chre . . . at|*

. *como La Tera et le Ixole stano nel mare et Molte prouinzie et monti et fiumi prenzipalli sono nela Tera El diamitro dela Tera sie meglia 6857 secondo Macobrio ezelentissimo Astrologo et geumetrico. El diamitro de Laqua| [sie meia 14796. El diametro de laiere sie m]eglia 31929¹/₇. E diamitro del fuoguo 68191²/₇. El diamitro de La Luna sie meglia 147149. El diamitro de mercurio sie meia 20(?)7533. El diamitro de venus sie meglia 692703. El diamitro del solle sie meia 1494781. El diamitro de mar(te) |. eia 6532374¹/₇ (Jupiter). El diamitro de saturno sie Meia 13997942⁴/₇. diamitrus horbis signiorum sie meia 29995591. diamitrus horbis aplanes sie meia 64276266⁵/₇. diamitrus horbis christalini sie meia 137724(?)856. pitagora dize che da La |.*

[El primo zircholo che zirconscriisse Il sopra schri]to mapamondo *sie de la raxon de la pasqua de la Rexurezione per Ani 95. Comenza nel 1453 adi primo aprile compie nel 1547 adi 10 Aprile. quando si Troua nele caxelle Letera M aueremo La pasqua de marzo. quando si Trouera Letera A Aueremo| [qudano la viene daprille. quando si troua letera B que]lano aueremo Bixestro. El secondo zircolo sie de 112 mexi dellano et quando Il sole Entra En cadauno*

dei 12 segni zelesti. El Terzo zircollo sie de 19 Letere de lalfabeto per Atrouar la raxon de La Luna. El quarto zircollo sie dei numeri (?) | [di zorni de mexi. El quinto sie de le ore.] El sesto zircollo sie Iponti de le hore. El setimo zircollo sie Le Letere dominicale. Lotauo zircollo sie Le ore de La grandeza del di En tututo (sic!) El tenpo de lano (?). El nono zircolo sie dei menudi che auanza oltra Le ore ne la grandeza del di. El dezim | uoler sapere quando rinoua La Luna de Zugnio del 1453. nel dito mileximo Abbiamo per letera concorente Letera C. Auoler atrouar La conioncion de la Luna dobbiamo Atrouar Letera C nel mexe de zugnio E alincotro se trouera di . . | (rin) ouera La Luna de cadauno mexe del dito mileximo. El mileximo comenz(a) de Zenaro nel 1454 aueremo concorente Letera d ecosi se schore ogniano 1 Letera de lalfabeto. Et quando sizunze aletera T lAltro ano drieto sitorna Aletera A. |. raxone comenza Ala Leuar del solle e intendese atanti di et Atante hore et atanti (?) ponti. ponti 1080 sintende 1 hora. Ale fiade En uno mexe si troua 2 fiade una Letera en quel mexe La luna rinoua 2 fiade etc.

⁷ By the "diameters" of the sun, moon, and planets Leardo obviously means the diameters of the orbits. Macrobius, *Commentaria in somnium Scipionis*, I, 20: 20, gives the diameter of the earth as 80,000 stades, which might, if converted into Arabic miles, be approximately the 6857 miles of Leardo. According to Macrobius the radius of the sun's orbit is 4,800,000 stades (*ibid.*, I, 20: 21); the diameter of the sun's orbit would therefore be 9,600,000 stades, or 120 times that of the earth. The diameter of the sun's orbit according to Leardo is 218 times that of the earth. On the authority of Porphyry, Macrobius (*ibid.*, II, 3: 14) gives the relative distances between the planets; but Leardo's figures bear no relation to these. I have not been able as yet to trace the origin of Leardo's figures.

⁸ H. Grotefend, *Zeitrechnung des deutschen Mittelalters und der Neuzeit*, Vol. I, Hannover, 1891, p. 203 (reference kindly suggested by Dom Hugh G. Bévenot of Weingarten Abbey, Württemberg, Germany).

⁹ Grotefend, *op. cit.*, p. 113, asserts that O was usually omitted

to avoid confusion with zero. Leardo, however, includes O. J and I are counted as one letter. The golden number of 1453 is 10; Leardo's A corresponds with golden number 8.

¹⁰ The following is a comparison of the times of the new moon on certain dates as indicated by Leardo with the actual times as determined for the meridian of Venice from Th. von Oppolzer, *Canon der Finsternisse* (constituting *Denkschr. Kaiserl. Akad. der Wiss. in Wien, Math.-naturw. Classe*, Vol. 52, 1887).

Leardo's Times				Actual Times	
1453	Dec. 1	? hrs.	203? pts.	Nov. 30	2.40 P. M.
1455	Apr. 16	21 hrs.	?	Apr. 17	12.22 A. M.
1456	Apr. 6	7 hrs.	229 pts.	Apr. 5	4.25 A. M.
1461	Jan. 11	21 hrs.	?	Jan. 11	8.44 P. M.
1468	Feb. 23	14 hrs.	747 pts.	Feb. 23	10.15 P. M.

The discrepancies are too great and too variable to enable us to come to any very definite conclusions as to the place or manner of origin of Leardo's figures.

¹¹ The division of the hour into 1080 points ($3 \times 6 \times 60$, as Dom Bévenot points out) is puzzling. More usually the hour was subdivided into four points. See Grotefend, *op. cit.*, p. 188.

¹² The dominical letter for 1453 was G.

¹³ On the basis of certain of the figures given by Leardo for the lengths of the days at about the times of the solstices, I have estimated that this table was worked out for about lat. $42^{\circ}45' N$, which is more nearly the latitude of Orvieto than that of Venice ($45^{\circ}30'$). (This calculation was made with the *Smithsonian Meteorological Tables*, 4th edit. (constituting *Smithsonian Misc. Colls.*, Vol. 69, No. 1), Washington, 1918: Table 87, "Duration of Sunshine at Different Latitudes," and Table 88, "Declination of the Sun for the Year 1899." The difference in the declination of the sun for 1452 and 1899 is negligible.) Dom Bévenot writes: "I fancy day lengths were reckoned roughly for degrees. Here in Weingarten about 1490 they used tables drawn up for lat. $45^{\circ} N$, though the place is actually $47^{\circ}40'$."

¹⁴ I am indebted to Dom Bévenot for the following comment:

"Concerning the calendar of saints I find the good Venetian has inserted besides the usual feast of St. Mark, patron of Venice, on April 25 two more: that of his apparition and the finding of his relics on June 25 and a third feast on Jan. 31 (translation). The last two were special for the diocese of Venice (Aquileia). The calendar for Aquileia is given at the beginning of Grotefend, *op. cit.*, Vol. 1, but does not quite tally with Leardo's list of saints. Perhaps this is because Grotefend has modernized the calendar. It may be that Leardo, living perhaps elsewhere than in Venice or its diocese, put in feasts that were dear to him. Indeed, in view of your findings for latitude from the length of the days [see preceding note], Rome is the most likely place, perhaps, for the Venetian embassy. It lies nearly in lat. 42° N; if we allow for Leardo measuring the length of the days according to the apparent sunset and sunrise, this may well explain a discrepancy of the greater part of a degree."

¹⁵ Berchet, *op. cit.*, p. 7.

¹⁶ See H. F. Lutz, *Geographical Studies Among Babylonians and Egyptians*, in *Amer. Anthropologist*, Vol. 26 (N.S.), 1924, pp. 160-174.

¹⁷ See Appendix, Nos. 305, 619.

¹⁸ Kretschmer, CE [see p. 63].

¹⁹ Particularly the famous Catalan Atlas of 1375 [see p. 63].

²⁰ For the names of and for bibliographical references relating to some of these maps see the list of references on pp. 63-67, *sub* CD, Mauro, Piz., Vat., Vilad.

²¹ This Latin translation of Ptolemy's *Geography* was begun by the Byzantine scholar Emmanuel Chrysoloras and completed by Jacopus Angelus in 1410; manuscripts of this translation were accompanied by maps, which, however, differ from the well-known maps in the Ptolemaic atlases of the late fifteenth and sixteenth centuries. The latter were the work of Dominus Nicolaus Germanus, known as Nicholas Donis. See A. E. Nordenskiöld, *Facsimile Atlas to the Early History of Cartography*, transl. by J. A. Ekelöf and Clements R. Markham, Stockholm, 1889, pp.

²² Like the Leardo map of 1452, the map of Walsperger, 1448, reveals Ptolemaic influence in some of its names although all the topographical features are strictly medieval. The Genoese world map of 1447 in its elliptical form is the result of a more serious attempt to reconcile the Ptolemaic geography with the traditional views. See Kretschmer, CE, pp. 76-77; on the Walsperger map, Kretschmer, *Eine neue mittelalterliche Weltkarte der vatikanischen Bibliothek*, in *Zeitschr. Gesell. für Erdkunde zu Berlin*, Vol. 26, 1891, pp. 371-406, reference on pp. 376-377. On the Genoese world map see the extended commentary of Fischer, *op. cit.*, pp. 155-206.

²³ Kret., CE pp. 82-83.

²⁴ See Kret., Port., pp. 81-93; see also E. L. Stevenson, *Portolan Charts: Their Origin and Characteristics, with a Descriptive List of those Belonging to the Hispanic Society of America*, New York, 1911, p. 19, where it is suggested that the faulty orientation of the Mediterranean may be in part connected with the persistence since the time of Ptolemy of the practice of placing Constantinople on maps "too far to the north by at least two degrees."

APPENDIX
DETAILED COMMENTS ON THE MAP

APPENDIX

DETAILED COMMENTS ON THE MAP

Explanation

The following commentary is divided into sections numbered with Roman numerals corresponding to the Roman numerals on the general key map (Fig. 4, at end of book). Each item is given an Arabic numeral which corresponds to the Arabic numerals on the detailed key maps (Figs. 5-10, at end of book).

For each feature which bears a place name and for each longer legend on the Leardo map the transcription is given below in italic. Many of these transcriptions, particularly of names written on edifices (castles, churches, etc.), are mere guesses, owing to the obscurity of the original. Particular difficulty was encountered in distinguishing between the letters *a*, *e*, *o*, *c*, and *t*, and between *s* and *f*. A clue to the reading of many names, however, was furnished by other maps contemporary with or earlier than that of Leardo. Illegible letters are indicated by dots; doubtful readings by (?); interpolated letters are enclosed in square brackets. Illeg. means "wholly illegible."

No data beside the transcriptions are given for such names as *f. tigris*, *corsicha*, *galizia*, etc., the meaning of which is obvious.

In the case of the less familiar names, the forms in which they appear on certain other medieval maps are supplied. In general, if a name occurs on the Catalan Atlas of 1375 (CA), on the Catalan map in the Este Library at Modena (CE), or on the Ptolemaic maps (Ptol.), no attempt is made to indicate its occurrence elsewhere.

Each doubtful identification with a medieval name is preceded by ?. For names along the coast of the Mediterranean, the Black Sea, and the Atlantic, references are given to the pages in Kretschmer's *Die italienischen Portolane des Mittelalters* (= Kret., Port.) where the variant spellings of these names as they are found in the more important portolans and portolan charts are listed and the places identified with modern localities.

Identifications with modern localities are indicated by =, or = mod.; with well-known ancient localities by =anct. Suggested but doubtful identifications are preceded by =?, and names for which I have been unable to find or to suggest any identification with a modern locality are indicated by =? standing alone.

With the identification of Ptolemaic and medieval names in the Far East, in Africa, and in Scandinavia, we enter upon a hazardous and controversial field. While in many instances I have indicated identifications that have been made by competent scholars, needless to say, these should not be accepted as final. One cannot but feel that where an identification is based upon mere similarity in sound it is often a case of one man's guess being as good as another's. The scope and purpose of the present study does not permit of an exhaustive examination of these questions of detail.

For more complete bibliographical data relating to publications referred to in abbreviated form in the key and for an explanation of the abbreviations, see pp. 63-67. In bibliographical references volume numbers are indicated in lower case Roman, book numbers in upper case Roman, and chapter and page numbers in Arabic type.

On the key maps where there are long rows of place names the first and last numbers only are indicated, with an arrow connecting them. This is done to avoid overcrowding.

The Arabic numerals are in general placed in positions corresponding to those of the legends on the original. This leads in some instances to the separation of the numbers from the symbols to which they relate (e.g., 73).

I. NORTHERN ASIA

Mountains

1 *M^o. alani*: Alani Montes in Scythia intra Imaum Montem, NE of Caspian Sea, Ptol. (VI, 14: 3 (FA 22)); = Mugodzhari hills in the Kirghiz steppes, a southern continuation of the Ural Moun-

tains (PW, i, 1281).—2 *M^o. ripei*: Rhipaei Montes, in which the Don rises, between Sea of Azof and Baltic, Ptol. (III, 5: 15 (FA 17)). See also 596 and PW, 2nd ser., i, 902–904.—3 *M^o. norosus*: Norossus Mons, NE of Caspian Sea, Ptol. (VI, 14: 5 (FA 22)).—4 *M^o. gaspio*: Caspii Montes, between Greater Armenia and Media, Ptol. (V, 13: 3 (FA20)); transferred to the far northeast as the haunt of Gog and Magog on medieval maps, including CA and CE. See Kret., CE, 202–206.

Rivers

5 *f. Tanai*: Tanais Fluvius, Ptol. (V, 9: 1, etc. (FA17)); = Don.—6 *f. rumus*: ?Rhymmus Fluvius, which enters the Caspian E of the Rha (Volga), Ptol. (VI, 14: 2, 4 (FA22)); = Volga.—7 *f. ras*: Rha Fluvius, Ptol. (V, 9: 12, etc. (FA22)); see PW, 2nd ser., i, 1–8; = upper Volga.—8 Unnamed eastern tributary of the Ras; = Kama or Viatka.

Other Natural Features

9 *zizera*: Zizera, shown as an island on CD and CA; = the *jazira* or island of Peskov in the Volga near Tsaritsin (Yule, Cath., i, 308); Hamy (395) suggests Sizran.—10 *dixerto de zornade | trenta* (desert of thirty days). Marco Polo's desert of Lop, said to take one month to cross (Polo, i, 196); a long inscription on CA in the same locality describes this desert and the devils' voices heard in it. See 33.—11 On this gulf as it is shown on CE appears the legend: "On these islands there are many beautiful griffons and falcons, and the inhabitants of the islands do not venture to seize them without the permission of the Grand Khan, lord of the Tatars" (Kret., CE, 208; from Polo, i, 270).

Edifices

(A) North of the River Ras and its Eastern Tributary

12 *zimachi|a(?)*: ?Sarmatia; = Russia. See also 600.—13 Tomb of the Grand Khan, beneath which an inscription reads thus: *q . . . li sie El sepulchro del | [gran can] et fano questa | . . . che quando El uen | portato a sepelir El uen acom|pagniato da*

molti homeni | armadi Iquali ozideno quel(?) | Itrouano su le strade et | dicono che le anime de coloro sono Benede|te per che Le aconpa|gniano Lanima del gran | can aunaltra uita. Similar inscription in corresponding position on CE (209-210) from Polo (i, 246, 250-251).—14 *R^o. de mas . . . (?)*: ?Moscaor, CD; = Moscow (Hamy, 394).—15 *cast. | ra.(?)*: ?Castrama, CA; Castrema, CE; = Kostroma (Hamy, 395).—16 *ezina(?)*: ?duplicate of 18.—17 *alla . . . (?)*: ?Allania, N of Black Sea, CA; = country of the Alans (Hallb., 13, 14). See also 604.—18 *etzi|na*: Polo (i, 223-225); Cordier (Ser M. P., 53-55) places Polo's Etzina in SW Mongolia, "on the river Hei-shui, called Etsina [= Etsin Gol] by the Mongols." See also 16.

(B) Between the Rivers Ras, Rumus, and Tanai

19 *trachia*: Torachi, CA; = Torjok (Hamy, 395).—20 *tufér*: Tifer, CA; = Tver, capital of an important Russian principality and seat of a bishop in the Middle Ages.—21 *botnia(?)*: = ?Bothnia; ?duplicate of 608.—22 *zitere|ae(?)*: ?[Ar]çetrea, Vat.; = Astrakhan (Pullé, Vat., 8).—23 *racoba(?)*: = ?

(C) South Side of East Branch of River Rumus

24 *borga*: Borgar, CA; Bolgara, Polo (i, 4, 6-8); = med. Bolghar, on the Volga 90 m. below Kazan (Yule, Polo, i, 7).—25 *Iornâ*: Ioram, CA; = ?Churmansk (Shurminsk) on the Viatka (Yule, Cath., i, 307).—26 *paschati (?)*: Pascherti, CA; = Bashkir. See Hallb., 69-70; Yule, Polo, ii, 492.—27 *fasa(?)*: Fachatim, CA; = ?Viatka (Yule, Cath., i, 307).—28 *sebur (?)*: Sebur, CA; = ?Sibir, Siberia. See Hallb., 465-466; Yule, Cath., i, 307.

(D) North and Northeast of Mt. Gaspio

29 *Marm|orea*: Marmorea, CA; = ? See Yule, Cath., i, 308.—30 *la . . . | te(?)*: = ?—31 *fugur(?)*: Sugur, CA. See Hallb., 489; = ?—32 *zin. . | lel(?)*: Cigicalas, CA; ?Province of Chingintalas, Polo, (i, 212-213); = ?region between Lake Baikal and Kamul (Yule, Polo, i, 214-215; Cordier, Ser M. P., 51-52).—33 *Lop*: On CA Ciutat de Lop N of Lake Yssicol; also a long

legend (from Polo, i, 196-197) describing Lop as a city where travelers rest themselves and their beasts and supply themselves with provisions before crossing the desert. See Hallb., 316-318; = vicinity of Lob Nor between Chinese Turkestan and the Gobi. See also 10.—34 *findaz|ion*: ?Sindachu, Polo (i, 285); Sinacius, CA; = modern Hsüan-hua, not far from Kalgan on the Great Wall (Yule, Polo, i, 295).

(E) Row West and South of the Gulf of the Three Islands
 35 *canp|iton*: Campicion, Polo (Pauthier's edit., i, 165); Campichu, Polo (Yule's edit., i, 219); Campicion = Chancjo of CA (Cordier, CA, 35); = ?Kan-chou in Kan-su (Yule, Polo, i, 220; Pauthier, l. c.; Cordier, l. c.; see also Hallb., 107).—36 *sia . . r(?)*: ?Siacur, CA; = ?—37 *tand|uc*: Tanduch, CA; Tanduc or Tenduc was the name of a plain, a province, and a city belonging to Prester John; in the province was the country of Gog and Magog (Polo, i, 240, 284); = ? See Yule, Polo, i, 285-288; Paul Pelliot in *Journ. asiatique*, May-June, 1922, pp. 595-596.—38 *suchc|hur(?)*: ?Sukchur in Tangut, Polo (i, 217); = Su-chou in Kan-su (Yule, Polo, i, 218).—39 *rafo|ibi(?)*: = ?—40 *tign|infor*: ?Chingianfu, Polo (ii, 176-177); = Chinkiang-fu (Yule, Polo, ii, 177-178).

Legend Between Rivers Ras and Tanai

41 *Idolatri*: On CE a legend applying to city of Castrema (see 15) explains that idolaters there worship a metal idol without head or hands (Kret., CE, 210).

II. FAR EASTERN ASIA

The surface of the map northwest of the Terrestrial Paradise has been rubbed in such a way that many of the names are illegible.

Mountains

The mountain system here corresponds essentially with that of CE; Ptolemaic names have been given to mountains and rivers.

42 *sa . . . s(?)*: = ?—43 *M^o. osmire(?)*: Asmiraei Montes in

Serica, Ptol. (VI, 16: 2 (FA23));= ?eastern end of T'ien Shan with the small low hill chains to the south (PW, ii, 1702).—44 *M^o. Tagurus*: Tagurus Mons in Serica (Θάγουρον ὄρος), Ptol., l. c.—45 *M^o. otorocoras*: Ottorocoras Mons in Serica (ibid.).—46 *M^o. semantinus*: Semanthini Montes in India intra Gangem, Ptol. (VII, 2: 8 (FA26));= ?coast range of Annam (PW, iv, 2050; see also Gerini, 376).—47 *M^o. anibi*: Annibi Montes, Ptol. (VI, 16: 2 (FA23));= ?eastern T'ien Shan above Qara Shar and Turfan (PW, i, 2258).—48 *M^o. Tanacomedo*: ?[Mon-]Tana Comedo [rum] (ἡ ὀρεινὴ Κωμηδών) in Sogdiana, Ptol. (VI, 12: 3 (FA22)).

Rivers

No rivers are shown in this region on either CA or CE; Leardo was evidently impelled to add them by the study of Ptolemy's Geography.

49 *f. ocardis*: Oechardes Fl. of Serica, Ptol. (VI, 16: 3 (FA23)).—50 *f. . . (?)*=?—51 *f. danas*: Demus Fl. of Sogdiana, a branch of the Jaxartes (see 117), Ptol. (VI, 12: 3 (FA22)).—52 *f. bascatiss*: Bascatis Fl. of Sogdiana, also a branch of the Jaxartes (ibid.).

Lake

53 Illeg.: Lacus Issicol, Leardo, 1448; Yssicol, CA;= ?either Lake Balkash or Issiq Kōl (Hallb., 563-564).

Edifices

(A) Northwest of the Terrestrial Paradise

54 *sachai*: ?Saciae, Ptol. (VI, 13 (FA22)).—55 *s . . . de | iaca(?)*: =?—56-62 All illeg.—63 *PARADIXO TERESTO*: The Terrestrial Paradise is placed in Africa on the earlier Leardo maps as well as on CE. See Wright, Lore, 261-263.

(B) West of Terrestrial Paradise

64 *sina*: ?Sinae, Ptol. (VII, 3 (FA26));= China (see Wright, op. cit., 271).—65 *R^o de . . . | .ge(?)*: =?—66 *Tango | . . . ti(?)*: ?Tangut, Polo (i, 203-205);= Kansu and southern Mongolia (Hallb., 507-508).—67 *R^o Tarse*: CA and CE have legends to the

effect that from Tarsia came the three Magi (Kret., CE, 197-198; Hallb., 515-517, 267-268);=vicinity of the T'ien Shan (Hallb., l.c.);=eastern Turkestan (Kret., l.c.).

Place Names

68 *pinca*(?): ?Pinzu, Mauro (Zurla, 36; name omitted on Santarem's copy of Mauro map in his Atlas, 45); ?Piju, Polo (ii, 141; see Hallb., 409);=P'ei-chou (Yule, Polo, l.c.).—69 *ruoenci* (?)=?

Longer Inscriptions

70 *prouinzia de og magog doue | foron*(?) *serati molti Trib . . . de | Judei* (province of Gog and Magog where many tribes of Jews were enclosed): Related legends on CA (Buchon and Tastu, 145-146) and CE (Kret., CE, 202-206); see Hallb., 260-265. On legend of Gog and Magog see also Wright, Lore, 287-288.—71 *Idolatri*: A reflection of the idolaters of the Grand Khan's domains frequently mentioned by Marco Polo.—72 *porte de fero*: The iron gates erected by Alexander the Great to enclose Gog and Magog, shown on CE; see 70.—73 *statoe de alesandr^o*: The statues of trumpeters set up by Alexander to keep guard over Gog and Magog, shown on CA and CE; see 70.—74 *dixerto doue eno | molti grifoni*: Griffons were placed in Scythia by many classical and medieval writers; see Hallb., 232-234.—75 *qu. . si manza | carne de omo* (here they eat the flesh of man): Cannibals were placed in these regions by many classical and medieval writers; they were often associated with Gog and Magog; see Hallb., 30-32.

III. INDIA

Mountain

76 *M^o. meandrus*: Maeandrus Mons in Farther India, Ptol. (VII, 2: 8 (FA26));=?Mahudaung mountains in Upper Burma (Gerini, 51, 832). No corresponding mountain shown on either CA or CE.

Rivers

The river system is more elaborate than, although somewhat analogous in its general pattern to, that of CA and CE. The

Indus and its branches seem to be lacking on the Catalan maps. I am unable to trace the origin of several of the river names.

77 *f. priolada*:=?—78 *f. tindarus*:=?—79 *f. masa|rus*:=?—80 *f. sumas*:=?—81 *f. bindas*: Bindas Fl. of India intra Gangem Fluvium (Ptol., VII, 1, 6 (FA25)); possibly the name is related to that of Bhiwandi near Bassein, N of Bombay (Tomaschek, in PW, iii, 268–269).—82 *f. madus*: Namadus Fl. of India intra Gangem Fluvium, Ptol. (VII, 1: 5 (FA25)).—83 *f. amarus*: Amarus is given as another name for the Indus on Vat. (Pullé, Vat., 16–17); no Amarus Fl. in Ptol.—84 *f. Indicus*: The course of the Indus as Leardo draws it is derived from Ptol. (VII, 1: 2 (FA25)).

Edifices

85 *predon | corcon*(?):=?—86 *terisin|ti*(?):=?—87 *zatin*(?): ?Zayton, CA; Zaytom, CE; Zayton, Polo (ii, 234–237), an important medieval Chinese seaport;=? See Yule, Polo, ii, 237–242; Cordier, CA, 48–49.—88 *cansai*(?): Ciutat de Cansay, CA; Kinsay, Polo (ii, 185–193, 200–208, 215–216);= Hangchow (Yule, Polo, ii, 193; Cordier, CA, 41–42).—89 *India*.—90 *R° de col|onbi*: Pruuinosa Columbo, CA; Coilum, Polo (ii, 375–376); see Hallb., 153–156;= Quilon (Yule, Polo, ii, 377–380).—91 *balesan*: Balaxan (Polo, Ramusio's edit., 1583, according to Hallb., 62); Cjutat de Baldassia, CA; Baldacia, CE;= Badakshan (see Yule, Polo, i, 157–163).—92 *taseta*: ?Rey del Tauris, CA; Rey Tauris, CE;= Tabriz (Hallb., 518–522).

Place Names on Coast

93 *penta*: Penta, next place E of Bangala, CA; Pentam, an island, Polo (ii, 280); see also Hallb., 411–413;= Bintan (Yule, Polo, ii, 280);= “the Be-Tumah (Island) of the Arab Navigators, the Tamasak Island of the Malays; and, in short, the Singapore Island of our day” (G. E. Gerini, in Journ. Royal Asiatic Soc., July, 1905, p. 509; see also Cordier, Ser M. P., 105); Gerini, 740, suggests that Penta of CA “might have been the historical continuation of the Ptolemaic” Pentapolis (Ptol., VII, 2: 2), which he places near the mouth of the Chittagong, at the head of

the Bay of Bengal.—94 *taine*: 'cjutat de cayna | acj finis catayo,' CA; see Cordier, CA, 39.—95 *bangala*: Bangala, CA; Polo (ii, 98-99); = Bengal.—96 *ianpa*: Janpa, CA; Chamba, Polo (ii, 266-268); see Hallb., 173-174; = Annamite coast (Cordier, in Yule, Polo, ii, 270); = C'ha-ban, the ancient Cham capital (Gerini, 240).—97 *ligo*: Lingo, CA; ?Locac, Polo (ii, 276) (this identification suggested by Pullé, CE, 46); = ?Siam, Borneo, or Malay Peninsula (see Yule, Polo, ii, 277-280; Hallb., 486; Cordier, Ser M. P., 104-105).—98 *macabin*: ?Mahabar, Mauro; Maabar, Polo (ii, 331-332); = Coromandel Coast (Hallb., 320-323).—99 *gr* . . . (?): = ?—100 *darsi*: = ?—101 *caruzia*: = ?—102 *butifilli*: Butifilis, CA; Mutfili, Polo (ii, 362); = Motupalli (Yule, Polo., ii, 362).—103 *caclur*(?): = ?—104 *coluto*: = Quilon (see also 90).—105 *cormos*: ?Hormuz (see 158) misplaced: "The c is constantly substituted for an aspirate by the Italian travellers (e.g. Polo's Cormos for Hormuz)" (Yule, Cath., ii, 242). See Hallb., 242-246; = Ormuz.—106 *elli*: Elly, CA; Ely, Polo (ii, 385-386); = Mt. D'Eli or Delly (Yule, Cath., iv, 74-75).—107 *maganor*: Manganor, CA; = Mangalore (Yule, Cath. iv, 73).—108 *diegei*: Diogil in interior of India, CA; = Deogiri, med. name of Daulatabad (see Yule, Cath. i, 310; iv, 21).—109 *cora*: ?Cory Promontorium, Ptol. (VII, 1: 11 (FA25)); = Cape Calymere (E. H. Bunbury, A History of Ancient Geography (2 vols., London, 1879), ii, 474).—110 *pez. mor*(?): Pescamor, CA; = "perhaps Barçelor" (Yule, Cath., i, 309; iv, 73).—111 *zitabor*: Chintabor, CA; = St. John's Point (Yule, Cath., i, 309; iv, 64-65).—112 *parzinar*(?): Paychinor, CA; = Barkur (Yule, Cath., i, 309; iv, 73).

Longer Inscriptions

113 *qui predico | san Tom|axo* (here preached St. Thomas): On the traditions regarding St. Thomas in India see Yule, Polo, ii, 353-359; Wright, Lore, 74, 272, 275, 279.—114 *qui nase | le noxe | dindia* (here grow the nuts of India): In the Ramusian version of Polo (ii, 354) occurs the following statement in connection with the shrine of St. Thomas: "The Christians who have charge of the church have a great number of Indian Nut trees, whereby they get their living."—115 *India dixer|ta*.

IV. CENTRAL ASIA

Mountain

116 *M^o. caropan*: Paropanisus Mons, Ptol. (VI, 11: 5, etc. (FA25)); = Hindu Kush (Hallb., 393). See also 123.

Rivers

117 *f. Ixartes*: Jaxartis Fl., Ptol. (VI, 12: 1, etc. (FA22)); shown but not named on CE; Flum d'Organci, CA; see Hallb., 280-281. On ancient and medieval knowledge of the Aral Sea, into which the Jaxartes flows, see W. Barthold, Aral, in *Encycl. of Islam*, Vol. 1, Leiden and London, 1913, pp. 419-420.—118 *f. Oxius*: Oxus Fl., Ptol. (VI, 9: 1, etc. (FA22)); ?Flum Amo, CA; not shown on CE; see Hallb., 24-26.—119 *f. rius*: Areios or Arius Fl., Ptol. (VI, 17: 2 (FA24)); see Hallb., 25, 47; PW, ii, 623; = ?Hari Rud.

Edifices

120 *organa*: ?Dupl. of 121.—121 *organ|zia*: Flum d'Organci, CA; see Hallb., 547-549; Yule, Cath., iii, 82; = Urganj, famous medieval city of Khorasmia on the lower Oxus.—122 *sagom|oa* (?): = ?Samarkand (see Hallb., 445-448).

Place Names

123 *paraponixa*: Paropanisades, Ptol. (VI, 18, etc. (FA24)); = northern Afghanistan (Besnier, 573). See also 116.—124 *archuxia*: Arachosia, Ptol. (VI, 20, etc. (FA24)); = Afghanistan (Besnier, 69). See Hallb., 33-34.—125 *arzeglia*: = ? See 129.—126 *dragiana*: Drangiana, Ptol. (VI, 19, etc. (FA24)); = Seistan (Hallb., 192).—127 *margana*: Margiana, Ptol. (VI, 10, etc. (FA22)); = environs of modern Merv (Besnier, 464).—128 *archuxia*: Dupl. of 124.—129 *arzegia*: Dupl. of 125.—130 *mesagit*: Massagitae, Ptol. (VI, 10: 2 (FA22)); a people of Scythia mentioned also by Pliny, Solinus, etc. (Hallb., 339-340).—131 *bocasan*: ?Bocar, CA; = Bukhara (Hallb., 79-80).—132 *orcania*: Probably a repetition of 120 and 121; might, however, be Hyrcania, Ptol. (VI, 9 (FA22)); see Hallb., 253-254; = part of Mazan-

deran (Besnier, 376).—133 *samaria*:=?Samarcand (see 122); Hallb., 448, suggests Samaria in Palestine misplaced, but adds: "pourtant la chose n'est pas probable."—134 *zagaspia*: Zaraspa, CA; Zariaspa or Zarispa in Bactriana, Ptol. (VI, 11: 7 (FA22));= Balkh (Besnier, 117). See also Kret., Walsp., 385.—135 *amol*: This name is applied to various towns and to a river in central Asia on CA and Mauro. Perhaps it represents a confusion of the name of the town of Amol in Mazanderan with that of the Amu Daria (Oxus). See Hallb., 24-26.—136 *seno*: ?Sena or Sina in Margiana, Ptol. (VI, 10: 3 (FA22)).—137 *lidazel*:=?

V. PERSIA

Lake and River

138, 139 Unnamed lake and river. On CA and CE the river rises in two lakes, the eastern and western being named on CA Mar Dargis (=Lake Van) and Mar de Marga (=Lake Urmia) respectively (Hallb., 43-44, 337-338). On Piz. the river is Flum Chexi; if Chexi is Khuzistan (see 164) the river possibly represents the Karun.

Desert

140 *Sarmania* | *dixerta*: Carmania Deserta, Ptol. (VI, 6(FA20));=interior of the modern Kerman. See also 153.

Edifices

(A) South Shore of Caspian Sea

141 *dise.n*(?): Deystam, CA;=?Dehistan, a district of Mazanderan (Hallb., 188).—142 *mexa|ndra*: Masandra, CA;=Mazanderan.—143 *galen*: Cap de Cilan, Cillam, Gellam, CA;=Gilan (Hallb., 217-218).—144 *aspaur*(?): Achdio, CA; Asidio, CE;=?—145 *godasp|i*: Gudaspu, Con. (59); Codaspi, Piz.;=?—146 *Turis*: Rey del Tavis in central Persia, CA;=Tabriz (Hallb., 518-522). See also 92.

(B) Interior

147 *trachse*: ?Dupl. of 67.—148 *zarma|tia*: ?Sarmatia, misplaced; see, however, 12, 600.—149 *siria*: Ciutat de Ssiras, CA;

Siras, CE;=Shiraz (Hallb., 470-471).—150 *parthi*|a: Parthia, Ptol. (VI, 5 (FA20)); =Khurasan (Hallb., 394-395).—151 *R^o odmi*|n(?):=?—152 *R^o de persia*: Persis, Ptol. (VI, 4 (FA20));=Persia.

(C) Persian Gulf Coast

153 *Sarmania abitada*: Carmania, Ptol. (VI, 8 (FA20));=Kerman. See also 140.

Place Names, North Coast of Persian Gulf

154 *semenar*: Femenat, CA; Semenat, Polo (ii, 398-399);=Somnath (Yule, Polo, ii, 400).—155 *demonela*: Damonela, CA;=Daibul (Yule, Cath., i, 309).—156 *chetimo*: Chetimo, CA;=Kij (ibid.).—157 *oncon*: Nocran, CA (omitted on Choix de doc. reproduction of CA);=Makran (ibid.).—158 *ormixon*: Hormision, CA;="Old Hormuz on the Continent" (ibid.). See 105.—159 *traman*: Creman, CA; =Kerman. See 153.—160 *usu*: Ussn, CA; "Husn Amarat? (see Edri., i, 379 [this reference is to P. A. Jaubert, Géographie d'Edrisi, traduite de l'arabe en français (Recueil de voyages et de mémoires publié par la Société de Géographie, Vols. 5 and 6, Paris, 1836-1840), i, 363, 390]) Any castle is Husn" (ibid.);=Essina (Lelewel, ii, 55).—161 *cadome*(?):=?—162 *seros*: Serans, CA; Sustar, Piz.;=?Siraf (Yule, l.c.); Sustar, Mediceo; =Shushtar (ibid.);=?"rivière Schirin" (Lelewel, l.c.).—163 . . .*ch*. . . (?):=?—164 *chesi*: Chesi, CA;=Khuzistan (Yule, Cath., i, 308); shown as an island on Piz.;="Scheich"(?Sheikh Shu'aib Island) (LaR., i, 65).

VI. MESOPOTAMIA AND SYRIA

Rivers and Lakes

165-168 The river system is more accurately drawn than on CA and CE, inasmuch as the Euphrates and Tigris join before reaching the Persian Gulf. On CA they enter the Gulf separately; on CE the Euphrates swings around into Egypt, entering the Nile just above Babilonia (Cairo). All three maps show a connection between the Euphrates and Mediterranean through the Orontes, but only Leardo makes the Jordan com-

municate with the Euphrates. On CA and CD an island, Zizera (see also 9), on CD said to be the site of Nineveh, is shown in the Euphrates, but on CE and Leardo this has become a lake. On CA the three lakes along the Jordan are labeled from N to S: Aquaron(=Lake Hule), Mar de Gallilea (=Sea of Galilee), and Mar Gamora (sea of Gomorrah, = Dead Sea).—165 *f. tigris*.—166 *f. eufrates*.—167 *f. Jordano*.—168 *f. . . soldin*|*no*: = Orontes (Kret., Port., 670).

Edifices

(A) Along the Tigris

169 *moxor*: Moror, CA; Moxor, Dalorto map (La R., i, 64); = Mosul (ibid.).—170 *apfes*: Aipsa, Vat.; Suq al-Ahvaz of the Arabic itineraries (Pullé, Vat., 13, 31, 34).—171 *Inporio* | *asiriorum* (empire of the Assyrians); Assyria, Ptol. (VI, 1 (FA20)).—172 *seruxia*|*na*: Susiana, Ptol. (VI, 3 (FA20)); = Khuzistan (Besnier, 726).—173 *babilo* . . . (?): Babylon or Babylonia. See also 323.

(B) In Syria

174 *ga* . . . | *a*(?).—175 *Jerusalem*: On the placing of Jerusalem at the center of the earth's surface see Wright, Lore, 259–261.—176 *c* . . . *r*(?): = ?

Place Names

(A) In Mesopotamia

177 *baldac*: Ciutat de Baldach, CA; = Baghdad.—178 *mexapo*: = Mesopo [tamia].—179 *birzi*: = ?Birejik.—180 *megan*: ?Mogan, Jordanus of Sévérac (Jourdain Catalani de Sévérac, *Mirabilia descripta: Les merveilles de l'Asie*, edit. by Henri Cordier, Paris, 1925, 93–94; Hallb., 356–357); = plain of Mugan near junction of Araxes and Kur.—181 *malaxim*: Malasia, CA; = Malatia.

(B) Interior of Syria

182 *alepo*: = Aleppo.—183 *antozia*(?): = ?Antioch.

(C) Syrian Coast

184 *soldin*: = Suweidiyeh, near ancient Seleucia (Kret., Port., 670).—185 *laliza*: = Latakia (ibid.).—186 *tortoxa*: = Tartus (ibid.).

—187 *tripoli*: = Tripoli (ibid., 671).—188 *zibele*: = Jebelch (ibid.).—189 *baruto*: = Beirut (ibid.).—190 *achre*: Acre (ibid., 672).—191 *gafo*: = Jaffa (ibid.).—192 *larixa*: = El-'Arish (ibid., 673).

VII. ARABIA

Mountains

193 *M^o. sinai*.—194 *M^o. felizis arabie*: Montana Arabiae Felicis, which, according to Ptol. (V, 17: 3; V, 19: 1 (FA19)), divides Arabia Petraea and Arabia Deserta on the north from Arabia Felix on the south; = Ash-Shera' mountains (see Alois Musil, *The Northern Hegâz*, New York, 1926, 255; the same, *Arabia Deserta*, New York, 1927, 502-503).—195 *M^o. prionous*: Prionotus Mons on S coast of Arabia, Ptol. (VI, 7:10 (FA21)); = ?

Edifices

(A) On Persian Gulf and Indian Ocean

196 *bazar*: Bassara, CA; = Basra.—197 *golfta|ta*: Golfaca, CA; Golfathan, Con. (42); = ? See Jiménez de la Espada, 205.—198 *Ieita* (?): Jepta, CA; Egepta, Con. (42); = ?—199 *cabat*: Cabat, CA; Con. (42); ?Calatu, Polo (ii, 449-451); = Qalhat in 'Oman (Yule, Polo, ii, 451; Hallb., 97-98).—200 *letrob*(?): Ietrib, CA; = ?Yathrib, the ancient name for Medina, misplaced.—201 *arabia*.

(B) Red Sea Coast

202 *senea*: Seneha, CA; = San'a (Hallb., 468-469).—203 *fidom|at*: Adromant, CA; = ?Hadhramaut.—204 *amei*: Mey, CA; = ?—205 *ald.|p*(?): Adep, Adem, CA; = Aden (Hallb., 8-10).—206 *eta|.* . . (?): = ?—207 *gaida*(?): Guja, CA; = ?Jidda.—208 *naba|tes*: = Nabataeans (Besnier, 509).—209 (?) Illeg.: = ?

(C) Interior

210 *sabea*: Arabia Sebba, CA (which gives an illustration and legend relating to the Queen of Sheba); = Saba or Sheba.—211 *La mecha*: Ciutat de Mecha, with legend, CA; = Mecca.

Regional Names

- 212 *Arabia* | *dixerta*: Arabia Deserta, Ptol. (V, 19 (FA19)).—
 213 *Arabia* | *petroxa*: Arabia Petraea, Ptol. (V, 17 (FA19)).

VIII. ASIA MINOR

River

- 214 *ff. rosso*: Odoric of Pordenone, Palatine version (Yule, Cath., ii, 102, n. 4); Pegalotti, 7 (ibid., iii, 164); = "the tributary of the Araxes, the Kizil Chai which waters Khoi" (Cordier, in the same, iii, 164, n. 1).

Edifice

- 215 *Tr* . . . (?): Troia; = Troy.

Place Names

(A) Interior

- 216 *saustia*: Sauasto, CA; = anct. Sebastea, mod. Sivas.—217 *Tabaca|san*: = ?—218 *suilia* (?): = ?—219 *sis*: Scisia, CA; = Sis.—220 *almesia*: = Amasia.—221 *laranda*: = anct. Laranda, mod. Karaman.—222 *anguri*(?): = Angora.—223 *aladachia*: = anct. Laodicea Combusta, mod. Ladik.—224 *filadelfi|a*: = anct. Philadelphia, mod. Ala Shehr.—225 *castamena*: = Kastamuni.—226 *congre*: = Changri.—227 *achrioteri*(?): = ?Ak Shehr.—228 *Jachrie*(?): = ? 229 *Janisari*: = Yeni Shehr.—230 *cariacasar*: = ?Afiun Qarahisar.—231 *nicomidia*.—232 *bursa*: = Brusa.—233 *lizia*: = anct. Lycia.—234 *perga|mo*: = anct. Pergamum.—235 *licn|ia*(?): = ?anct. Lycaonia, misplaced.

(B) Black Sea Coast

- 236 *Tripoli*: = Tireboli (Kret, Port., 648).—237 *cirisonda*: = Kiresün (ibid.).—238 *lauatiza*: Lauona, CA; = Vona Bay (ibid.).—239 *simiso*: = Samsun (ibid.).—240 *sinopi*: = anct. Sinope, mod. Sinob. (ibid.).—241 *do . . s . . l . .* (?): Docastelli (ibid., 650); = Kidros (ibid.).—242 *borli*: = ?Boli (which, however, is in the interior).—243 *samastro*: = Amasra (ibid.).—244 *chio*: Thio, CA; = anct. Thios Prom. (ibid.).—245 *punta rachia*: = anct.

Heraclea Pontica, mod. Bender Ergli (ibid.).—246 *algiro*:=
Anadoli Kawak (ibid.).

(C) Aegean coast

247 *lesm|ire*:=Smyrna (ibid., 653).

IX. ARMENIA, CAUCASIA, AND SOUTHEASTERN RUSSIA

Mountain

248 Mt. Ararat is labeled *larche de noe*.

Rivers

249 A river connecting the Sea of Azof with the Caspian is shown on CA and CE, but without the branches reaching the Black Sea; on Piz. this river is named Flm' Cicopo (the Cicopa of CA and other portolan maps being a north branch of the Kuban delta; Kret., Port., 646);=Kuban River (ibid.).

Caspian Sea

250 *Mare de Abachu*(?) (Sea of Baku): Mar de Sarra e de Bacu, CA; Mar de Sala e de Bacu, CE.

Edifices

(A) West Coast of the Caspian Sea

251 *Illeg.*:=?—252 *famach|i*: Siamachi, Vat. (Pullé, 9); =
?Shemakha (ibid., 8, n. 4).—253 *baram|achi*: Barmachu, CA; =?
—254 *abachu*: Bacu, CA; =Baku.

(B) Between the Black and Caspian Seas

255 *porte | deuee*(?): ?Porte de Fer (see 72 and Hallb., 414).—
256 *armin|ia*.—257 *armin|ia*: Dupl. of 256.

(C) Coasts of Sea of Azof and Black Sea

258 . . *na*(?):=?Tana, important medieval commercial city at
mouth of the Don;=mod. Azof (Kret., Port., 645; Hallb., 503-
504).—259 *trab|exon|da*: =Trebizond (Kret., Port., 648).

Place Names in Southeastern Russia

260 *seuastopoli*: =anct. and med. Sebastopolis on coast of
Abkhasia (Kret., Port., 647).—261 *auogaxi*:=Abkhasia (ibid.,

646).—262 *mengreli*: Mingrelians or Mingrelia (ibid., 647).—263 *zichia*:="regional name of Circassia" (ibid., 646).—264 *copa*:="Copa (ibid.).—265 *matraca*:="Matrega, Genoese trading town on Taiman Peninsula (ibid.).

X. INDIAN OCEAN, PERSIAN GULF, AND RED SEA

266 *Ma* *dicho*: Mare Indicho.—267 *Mare de persia*.—268 *M* : Mare rosso.—269 . . . *Taprobana*: Trapobana, CA, CE; the Taprobane of the ancient geographers was Ceylon; in the Middle Ages the name was probably applied to Sumatra (Cordier, CA, 57–58; Kret., CE, 107; for suggested identifications of places shown in Trapobana on CA see Gerini, 646–647).—270 *famda|bo(?)*: ?Regio Femarum (for Feminarum) on island of Iana, CA, which is perhaps a reflection of Polo's story of the Male and Female Islands (ii, 404–405); see also Gerini, 647, n. 2.—271 *Illeg.*: =?—272 *m* . . . (?) : ?Malao, on both Trapobana and Iana, CA; Mallao, on Jaua, CE:=?—273 *leuia*: Leroa, on Trapobana, CA; =?—274 *y . caina*: Caynam, CA, CE;=?Andaman Islands (Buchon and Tastu, p. 137).—275 *ixole doue na[se] p | et altre spe[z] ie* (islands where pepper and other spices are produced): Legend on CA runs: "In the sea of the Indies are 7548 islands of which we cannot enumerate here the marvelous riches, not only in gold and silver but also in spices and precious stones"; from Polo (ii, 264), who also, like Leardo, mentions pepper.—276 *y^a de ceridus*: Ceredim, CE; ?Serendib, Arabic name for Ceylon.—277 *y . . corto(?)*: ?Setrocha, CE;=?Socotra.—278 Nameless island, corresponds in shape and position to the Iana of CA and Jaua of CE;=Java (Cordier, CA, p. 61);=Sumatra (Gerini, p. 834).—279 Legends on this island illegible; it is, however, similar in shape to Salam or Silan of CE;=?Ceylon.—280 *Illeg.*: =?—281 *y . . siliraoil(?)*:=?

XI. SOUTHERN AFRICA

Mountains

282 *M^o elefans*: Elephas Mons on the east coast of Africa, Ptol. (IV, 7: 10 (FA15)); =Ras el-Fil (Vivien de St. Martin,

288).—283 *Monti doue se caua m . . . ro* [molto oro, Leardo, 1448] (mountain where much gold is mined): Pliny (Nat. hist., VI, 189) mentions the abundance of gold in Ethiopia between Napata and the Red Sea.

Edifices

(A) South Shore of the Red Sea

284 *gobari*: Zobar or Gobar, Leardo, 1448;=?Zanzibar (Santarem, iii, 437).—285 *uigie*: ?Vuigie, in interior of Prester John's realm, Mauro;=?—286 *tobo|let(?)*:=?—287 *scuendn(?)*: Stuenti, Mauro;=?Suakin.—288 *traged|it(?)*: Tragoditi, Mauro; Troglodytica Regio, in East Africa, Ptol. (IV, 7: 27 (FA 15));=country along W coast of Red Sea between Egypt and Abyssinia (Vivien de St. Martin, 471-474).—289 *satoris(?)*: Catoris, Mauro;=?—290 *basag . . |r(?)*:=?

(B) Eastern "Horn" of Africa

291 *acoan*: Aicoum de Afra, Leardo, 1448 (Santarem, iii, 437); Hascum, Mauro;=?Axum in Abyssinia (La R., ii, 115).—292 *safola*: Sofrala, Mauro;=?Sofala.—293 *medi|fola*:=?—294 *prouinzie | dofir*: P. Davaro, Mauro;=?Dawaro in Abyssinia (La R., ii, 113, 132).—295 *gfen|uj(?)*:=?—296 *flmodo(?)*:=?—297 *dela . . (?)*:=?

(C) Central Region

298 *milua|s(?)*:=?—299 *Inperio del | presto Jani* (Empire of Prester John): Prester John is shown in this part of Africa on CA and CE. On the origins of the legend of Prester John and on the transference of the realm of this mythical potentate from Asia to Africa in popular tradition see Kret., CE, 99-101; Wright, Lore, 283-286.—300 *ta . . . |n(?)*:=?—301 *grafai*:=?—302 *fe . . . (?)*:=?—303 *mesa*: Con. (36) says that Prester John always resides at Malsa (Jiménez de la Espada, 222; La R., i, 61).—304 *carap(?)*:=?

Longer Legends

305 *DIXERTO DEXABITADO PER CALDO* (desert uninhabited on account of heat): Leardo, 1448, Walsperger, 1448, and Borgia, 1452, "all show a similar torrid zone, though the theory

was protested against by Fra Mauro, Diogo Gomez, and doubtless by others" (A. Rainaud, *Le continent austral: hypothèses et découvertes*, Paris, 1893, 199); on the development and history of this theory see especially Rainaud, *passim*; also Wright, *Lore*, 18, 157-161.—306 *dixerto*.—307 *qui nase homeni | che ano Il uolto | nel petto* (here are born men who have the face in the chest): Such monsters are described by Solinus, 31, 5; Isidore, *Etym.*, XI, 3, 17; and shown on the Hereford map (Miller, *Mappaemundi*, iv, 45).

XII. MIDDLE AND LOWER NILE REGION

Mountains

308 *M°. dimas*: *Montis dimas*, Mauro;=?—309 *M°. libuzio*: *Montes Libyci*, Ptol. (IV, 5: 19 (FA14));=escarpment overlooking Nile Valley on W (PW, xiii, 148).—310 *M°. pilazi*: *Mons Pollaza*, Mauro; ?*Pylaei Montes* in Ethiopia, Ptol. (IV, 7: 26 (FA15));=?—311 *M°. arazas*: *Arangas Mons*, in *Lybia Interior*, Ptol. (IV, 6: 12 (FA15));=?

Rivers and Lakes

312 *f. nillo*: The course of the Nile and its tributaries corresponds essentially with that of CE (Kret., CE, 89-91; see also 338).—313 *f. stapus*: *Astapus Fl.* in Ethiopia, Ptol. (IV, 7: 24 (FA15)); =*Bahr al-Azraq*, or *Blue Nile* (PW, ii, 1775-1776; Besnier, 96).

Other Natural Features

314 *Etiopia dezito*: *Ethiopian desert*.—315 *Libia dixerta*: *Deserta Libya*, Ptol. (IV, 3: 27 (FA13)).—316 *dixerta arenoxa | qui nase animali quatrupedi che ano Il uolto | domo* (sandy desert where are born quadruped animals which have the face of a man): Possibly refers to the *mantichora* of Pliny (*Nat. hist.*, VIII, 21; see Wright, *Lore*, 468).—317 *y^a. meroe*: *Island of Meroë*, Ptol. (IV, 7 (FA15)).

Edifices

(A) West Coast of Red Sea

318 *filistina*:=*Palestine*.—319 *aid . p(?)*: *Aydip*, CA;=*Aidhab*.—320 *cidor(?)*:=?—321 *climas*: *Climas*, Mauro;=?

(B) On the Nile and Stapus

322 *alesan|dria*: Alexandria, CA.—323 *babilonia*: Babillonja, CA; Babilonia, CE;=the medieval name of Old Cairo.—324 *sacon*: Sohan, CA; Soan, CE;=anct. Syene, mod. Aswan.—325 *bac* . (?):=?—326, 327, 328, 329 Illeg.

(C) On North Shore of West African Gulf

330, 331 Illeg.

Place Name, West Coast of Red Sea

332 *tes* (or *tos*): ?Chos, CA; Con.;=?Qoseir

XIII. UPPER NILE REGION AND WEST AFRICA

Mountains

333 *M°*. *Bardtion*(?): Bardetus Mons in Ethiopia Interior, Ptol. (IV, 8: 6 (FA15)).—334 *M°*. *Lune docho | nasitur nillo* (Mountains of the Moon from which the Nile rises): According to a long legend on CE these mountains are called "Gibel Camar by the Saracens, which means Mountains of the Moon in our tongue"; they are so high that although they lie on the equator both poles may be seen from them. The famous Mountains of the Moon were first mentioned by Ptolemy (IV, 8: 3); see also Kret., CE. 91–92.—335 *M°*. *capis*: Caphas Mons in Libya Interior, Ptol. (IV, 6: 9 (FA15)); see PW, x, 1892.—336 *M°*. *deo ue | chulum*(?): ?Deorum Currus Mons in Libya Interior, Ptol. (IV, 6: 9 (FA15)); farthest point south on W coast of Africa reached by Hanno;=Mt. Sagres in Sierra Leone (Vivien de St. Martin, 394–396);=Cameroons Mountain (see articles by J. de Hart in Journ. African Soc., xxv, 1926, 264–277 (noted in Geogr. Rev., xvi, 1926, 661–662), and by R. Hennig in Geogr. Zeitschr., xxxiii, 1927, 378–392).

Island

337 *y^a. de prenje*: ?Insula Palola, Carignano, Piz. (Fischer, 141);=?

Rivers, Lake, Seacoast

338 The upper course of the Nile with the great lake and its tributaries rising in the Mountains of the Moon (334) corresponds

essentially to CE (Kret., CE, 89-91); CE, however, shows a subterranean passage of the river W of Meroe. On ancient and medieval theories regarding the course of the Nile, see Simar, *passim*; Langenmaier, 47-48; Wright, Lore, 304-306. See also 312, 334.—339 The bay with the red, cross-shaped island is represented on CE by an island in the delta of the West-African river.

Desert

340 *mare | arenoxe* (Sandy Sea): On CE there are two legends indicating sandy areas in West Africa (Kret., CE, 96).

Edifices

(A) North of Nile-Senegal

341 *R° dogal|n* . (?): ?Organa, CA; Rey dOrgana, CE; = empire of Ghana or Kanem (La R., i, 136).—342 *R°*(?):=?
—343 *almesia*: Almesia, CA; = Mzab (La R., i, 136).—344
ma . . (?): =?

(B) South of Nile-Senegal

345-349 Illeg.—350 *R° m* . . . | *nel*(?):=?.—351 Illeg.

Place Names

(A) Between Mt. Bardtion and the Mountains of the Moon

352 *elcor*(?): Probably an Arabic name with article, el;=?—353
anesa:=?—354 *elundia*: see 352;=?—355 *dendenie*: ?Dendi of Antony Malfant's narrative of a voyage to Tuat in 1447 (La R., i, 154).—356 *dris|na*:=?—357 *solla*: Soll, CE; ?Sala, Idrisi;=?
?Sele, S of Timbuktu (Miller, Arab., 162).—358 *burga*: Burga, CE, a mountain in Gotonye, Con. (34); =?Burda, "mountain region of the Sudan E of river Shari, which flows into Lake Chad, and S of town of Kengas" (Jiménez de la Espada, 186).—359
quilan: Quilam, CE;=?

(B) North of Headwaters of the Nile

360 *ganugia*: ?Geugeu, CA;=Gão (La R., i, 136).—361 *geuene*: Ginyia, CA; Guineua, CE;=Ghana (La R., i, 135; Kret., CE, 96-97).—362 *atelas*:=?—363 *ansica*: Anzicha, CA;=In Ziza (La

R., i, 136, 138).—364 *tablet*: Tabelbelt, CA; Tibalbert, Con. (30); = Tabelbert (La R., i, 118).—365 *artixe*:=?—366 *tocor*: Tacort, CA;=Tuggurt (La R., i, 136). See also 368.

(C) Eastern Row of Names N of River Senegal

367 *tutega*: Tutega, Vilad.;=Tijikja (La R., i, 135).—368 *tocor*: Dupl. of 366.—369 *udam*: Sudan, CA;=Sudan (La R., i, 136).—370 *tusont*:=?—371 *tagaza*: Tagaza, CA;=Teghaza (La R., i, 136). See also 373.—372 *getulla*: Gaetulia, Ptol. (IV, 6: 15 (FA15));=desert region S of Morocco.—373 *tagase*: Dupl. of 371.—374 *temenadis*: Temenasin, CA;=?Tlemsen.—375 *Regnio de belemon*: Rex Belmarin, Bianco; “dynasty of Beni Marin which ruled in Fez in the thirteenth century and at Tremcen [Tlemsen] until 1407” (Simar, 295, from Santarem, iii, 368).

(D) Western Row of Names N of River Senegal

376 *Fisengan*: Ihsengam, Vilad.; “name now used by the negroes to designate the sandy regions on the west bank of the Senegal” (La R., i, 134).—377 *uilodesci*: This name is so much like that of the map-maker, Mecia de Viladestes, that one is almost tempted to believe that his signature has somehow found its way as a place name to Leandro’s map.—378 *tasu*:=?—379 *mascarota*: Mascarota, CA; Masquarota, CE;=Tamgrut (La R., i, 137).—380 *agof*:=?—381 *dunardin*: ?Tarudant, Idrisi (Miller, Arab., 177);=?Tarudant.—382 *ubêda*: Ubaâduch, CA;=?—383 *altamar*: Alamara, CA; Zichialhamara, Con. (29);=the Saghuiet el-Hamra in northern Rio d’Oro (La R., i, 134).—384 *safinet*(?):=?

XIV. NORTH AFRICA

Mountains

To the mountain range of North Africa, a stock feature on medieval maps, Leandro adds at random garbled Ptolemaic names.

385 *M° Jouis*: Dios vel Jovis Mons in Province of Africa (Tunisia), Ptol. (IV, 3: 18 (FA13)), badly out of place;=?Jebel Zaghwan, SW of Tunis (Müller, i, 635).—386 *M° galcas*: Zalacus

Mons in Mauretania Caesariensis (Algeria), Ptol. (IV, 2, 14 (FA12));=a part of the Lesser Atlas SW of Algiers (see Müller, i, 601).—387 *M^o. usalatu|s*: Usalaetus Mons in Province of Africa (Tunisia), Ptol. (IV, 3: 18 (FA13));=Jebel Usselet near site of Hadrumetum (Müller, i, 635).—388 *M^o. masarus*: Mampsarus Mons in Province of Africa (Tunisia), Ptol. (l. c.).—389 *Mons. bur.ea(?)*: Buzara Mons where Mauretania Caesariensis, the Province of Africa, and Libya Interior meet, Ptol. (IV, 2: 16; IV, 3: 16 (FA13));=?Jebel bu-Kahil, S of Bu-Saada, Algeria (PW, iii, 1094).—390 *M^o. flruxu(?)*: Phrouraesus Mons in Mauretania Caesariensis (Algeria), Ptol. (IV, 2: 16 (FA12));=?Jurjura, SE of Algiers (Müller, i, 602).—391 *M^o. garis*: Garas Mons in Mauretania Caesariensis, Ptol. (l. c.).—392 *Alta mons*: Atlas Mons Minor on Atlantic coast of Mauretania Tingitana (Morocco), Ptol. (IV, 1: 2 (FA12)); see PW, ii, 2119.—

River

393 A river rising SW of the Atlas Mountains and entering the western Mediterranean is shown on many fourteenth and fifteenth century maps. On CA, instead of rising in a lake with three tributaries, as Leardo represents it, the river encircles the city of Sigilmessa (=Tissimi, in oasis of Tafilet, Miller, Arab., 177), where it is entered by four tributaries from the south; a branch is also shown entering the Atlantic. On CE the river corresponds essentially to that of CA, except that the branch to the Atlantic has been made the main stream and the arm leading to the Mediterranean has been separated from that sea and converted into a doubled-channeled tributary of the main stream.

Edifices

(A) On or Near the Mediterranean Coast

394, 395 Illeg.—396 *africa(?)*: The Roman Province of Africa (Tunisia), Ptol. (IV, 3 (FA13)).—397 *tunixi*: =Tunis (Kret., Port., 679).—398 *bona*: =Bône (ibid., 680).—399 *se . . . (?)*: Septa of Portolan charts;=Ceuta (ibid., 683).

(B) Interior, Along Northern Base of Mountain Range
400 Illeg.—401 *bizesta*(?): ?Bichest, CA;=?Biskra.—402, 403 Illeg.

Place Names

(A) On Mediterranean Coast

404 *lucha*:="A place near Cape Lukka" or Ras el-Melh (Kret., Port., 675).—405 *c. bonand|rea*: Cape Bonandrea of Portolan charts;=Ras el-Hillil (ibid.).—406 Illeg.—407 *bni-cho*(?): Bernicho of Portolan charts;=anct. Berenice, mod. Benghazi (ibid., 676).—408 Illeg.—409 *licodia*:="Ras el-Omja (ibid.).—410 *siden*: ?Sidra, CA;=island of Abu Sheifa (Bu Sceifa of Italian maps) (ibid.).—411 *casero sensor*:="Sensur (ibid., 677).—412 *rasimabaxi*:="Ras el-Makhbez (ibid.).—413 *stora*:="Stora (ibid., 680).—414 *ancol*:="Collo (ibid.).—415 *zizeri*:="Jijeli (ibid.).—416 *buzia*:="Bougie (ibid., 681).—417 *titelis*:="Cape Tedless (ibid.).—418 *arzeia*:="Arzeu (ibid., 682).—419 *or.m*(?):="Oran (ibid.).—420 *serem*:="River Senam (ibid.).—421 *om.e*(?):="Honain, Cape Noe (ibid.).—422 *milela*:="Mellila (ibid., 683).—423 *larandie*: Larcudia of the Portolan charts (ibid.);=?—424 *molc|mar*(?): Molcemar of Portolan charts;=Alhucemas Islands (ibid.).

(B) Interior of Morocco

425 *manosa*: ?Manora of Portolan charts;=Mehedia (Kret., Port., 684).—426 *mosa*: ?Messa of Portolan charts;=?Massa (ibid., 685).—427 *maran*:=?—428 *zemar*: Zamor of Portolan charts;=Azammur (ibid., 684).

(C) Coast of Morocco

429 *ninfe*: Niffe of Portolan charts;=Casablanca (ibid.). 430 *sofin*:="Safi (ibid.).

XV. BLACK AND MEDITERRANEAN SEAS

Names of Seas

431 [Mare] *mauro*(?): Unnamed on CA and CE;=Black Sea.—432 [Mare] *de adriano*:="Adriatic Sea.—433 *Mare Me*[diterr]ano.—434 *Mare de Leone*:="Gulf of Lions.

Islands

435 *Cip[ro]*: = Cyprus.—436 *rodo*: = Rhodes.—437 *sio*: = Chios (Kret., Port., 660).—438 *arcipellago*.—439 *negropo[nte]*: = Euboea.—440 *y^a de chrete* (?): = Crete.—441 *crsicha*.—442 *sardignia*.—443 *minoricha*: = Minorca.—444 *Maioricha*: = Majorca.—445 Illeg.

XVI. SOUTHWESTERN EUROPE

Rivers

446 The Guadalquivir: similar course on CA and CE.—447 *f. lizer*: = Loire.—448 *f. stequana*: = Seine.—449 *f. rode|nus*: = Rhône.

Edifices

450 *gr* . . . (?): = Granada.—451 Illeg.—452 *span* . . . (?): = Spain.—453, 454 Illeg.—455 *bart* . | *nia*: = Brittany.—456 *fr* . . . | *a*: = France.—457 Illeg.—458 . *ugn* . . (?): = ?Avignon.—459 *proui* | . . (?): = ?Provence.

Place Names

(A) Atlantic Coast

460 *sibilia*(?): = Seville.—461 *lisbo|na*.—462 *galizia*.—463 *astora*: = Asturias.—464 *ganti|et*: = ?

(B) Mediterranean Coast

465 *malica*: = Malaga.—466 *sarauignia*: = Salobrena (Kret., Port., 581).—467 *al*(?)*meria*.—467a *carta*.(?)*enia*: = Cartagena.—468 *lacantera*: = Alicante (ibid., 584–585).—469 *denia*.—470 *toloxa*: = Tolosa.—471 *ualenza*: = Valencia.—472 *tortoxa*: = Tortosa.—473 *sale*: = Salou.—474 *taragona*.—475 *barzelona*.—476 *anpurie*: = Ampurias.—477 *coliuro*: = Collioure.—478 *narbona*.—479 *monpolier*: = Montpelier.—480 *aquemorte*: = Aigues Mortes.

Regional Name

481 *guascognia*: = Gascony.

XVII. ATLANTIC OCEAN AND ISLANDS

482 *Mare de spagnia*.—483 Illeg.; = Canary Islands.—484 *Ingilterra*.—485 *Schoz* . (?): Scotia; = Scotland.

XVIII. CENTRAL EUROPE

Mountains

486 The Alps run due north from northern Italy.

Rivers and Lake

487 *f. renus*: = Rhine.—488 The Elbe, unnamed (see, however, 513); similar course on CE, CA, Bianco, and other maps.—489 *f. prexant*: = ?—490 *f. sudum'*(?): Sudumera, CA; = river of Sandomir, or Vistula (Hamy, 402).—491 *lacus senire*(?): ?Lacus Alech, CD; Lacus Nerja, CA; = ?Bay of Putzig (Hamy, 400).

Edifices

492-497 All illeg.—498 *polana*: Polonia, CA; = Poland.—499 *panon|ia*: = ?anct. Pannonia.—500 *carcou|ia*(?): Cracouja, CA; = Cracow.—501 *podol|.a*: = Podolia.

Place Names

(A) On the Rhine

502 *austrua*(?): = Austria.—503 *colognia*.

(B) Between Rhine and Elbe and on Elbe

504 *bemia*: = Bohemia.—505 *praga*: = Prague.—506 *drensna*: = Dresden.—507 *misen*: = Meissen.—508 *guse*: Guise, CA; = Würtzen (Hamy, 407).—509 *aquis*: = ?—510 *mogropes*: Mangobror, CA; = ?Magdedurg.—511 *argenimon|de*: Argent Munde, CA; Tangermünde (Buchon and Tastu, 49).—512 *stendar*: = Stendal.—513 *alba*: River name made into a place name; = Elbe.

(C) Between Elbe and Baltic

514 *gara gorda*(?): Garagona, CA; = Glogau (Hamy, 403).—515 *schlauonia*: = Sclavania, the name applied to the Slavic frontier region of Germany in the Middle Ages (Spruner-Mencke, Histor.

Atlas, Mittelalter, No. 31).—516 *sasonia*: = Saxony.—517 *ludus* [*maior*: Ludis Magna, CA; Lundis Magna on Ptolemaic maps of the type called Scandico-Byzantine by Nordenskiöld (Periplus, 88); Bondismaguc, Con. (7; see Jiménez de la Espada 184-185); = ?Lüdershagen, near Stralsund (Lelewel, ii, 65; Hamy, 400).—518 *dazia*: = Denmark.—519 *prusia*: = Prussia; see 523.—520 *colbera*: = Kolberg.—521 *alec*: Alech, CA; = Hela (Lelewel, ii, 65).—522 *stetin*.—523 *pursia*: Dupl. of 519.—524 *godanse*: Godansse, CA; = Danzig.—525 *scheipe*(?): Scorpe, CA; = ?Stolp (Hamy, 400).—526 *Sudana*: Sudona, CA; = Sandecz (ibid., 402).—527 *pante|nia*: Prutenja, CA; = Königsberg on the Pregel (ibid., 401).—528 *eue*(?): = ?—529 *albig*: Albing, CA; = Elbing (ibid., 402).

XIX. ITALY

River

530 *f. po*.

Edifices

531 Illeg.: = ?Genoa.—532 Illeg.: = ?Florence.—523 Illeg.: = ?Rome.—534 Illeg.: = ?Naples.—535 Illeg.: Vignette represents St. Mark's and the Campanile; = Venice.

Place Names

536 . . *g* . . (?): = ?Reggio di Calabria.—537 *cotron*: = Cotrone (Kret., Port., 618).—538 *taranto*.—539 *o[t]ranto*.—540 *brandizo*: = Brindisi.—541 *manfredonia*.—542 *guasto*: = Vasto (ibid., 621).—543 *ortona*.—544 *ancona*.—545 *fano*.—546 *pexara*: = Pesaro.—547 *rimano*: = Rimini.—548 *zexen*^o: = Cesenatico (ibid., 623).—549 *rauena*: = Ravenna.—550 *ferara*.—551 *chioca*: = Chioggia (ibid.).

XX. SOUTHEASTERN EUROPE

Rivers

The river system corresponds generally with that of CA and CE.

552 *f. donoia*: = Danube.—553 *f. morana*: = Morava.—554 *f. drina*: = Drin.—555 *f. moree*(?): = ?Moldau.—556, 557, 558:

Three unnamed islands in the Danube; on CA these are named: Insula de Jaurim, Insula Buda, Insula de Sermona(?).

Edifices

559 *bu* . . . (?):=?Buda.—560 *m . . l . .* (?): =?—561 *ongar|ia:* = Hungary.—562 *serui|a:* = Serbia.—563 *bosn|a*(?): = Bosnia.—564 *ulachia:* = Wallachia.—565 *bulga|ria.*

Place Names

566 *dalmazi.*—567 *albania.*—568 *modon:*=Methone (Kret., Port., 635).—569 *coron:*=Corone (ibid.).—570 *salonichi.*—571 *filipopoli.*—572 *sofia.*—573 *andernopolli:*=Adrianople.—571 *gari-polli:*=Gallipoli.—575 *pera.*—576 *costantinopoli.*

XXI. BALTIC SEA

577 *Mar de alemani:*=Baltic Sea.—578 *y^a(?) gotlandia:*=Gottland.—579 Illeg.

XXII. SCANDINAVIA

Mountains

580 The mountain system is a simplification of that shown on CE.

Rivers

581 *f. netur:* Flū Nectir, CE; Fl. Vectur, CD;=Motala, outlet of Lake Vettern (Hamy, 387).—582 *f. turontes:* Turuntus Fl. in Sarmatia, Ptol. (III, 5: 2 (FA9));=Dvina (Müller, i, 412).

Longer Legends

583 *in q[uesta par] te si caualca su zervi | tori et montoni et su queli fano le | loro bataie* (in this region they ride on deer, bulls, and sheep, and on these they make their battles): Compare legend on CE (Kret., CE, 214).—584 *In questa parte sta zente che non uide | Il sole 4 mexe de lano* (in this region there are people who do not see the sun for four months of the year): Santarem (iii, 409, note 2) suggests a relation between this and a passage in Jordanis, De

rebus Geticis (Monumenta Germaniae historica, Auctorum antiquissimorum, Vol. 5, Part 1, Berlin, 1882, p. 58) descriptive of the Adogitae of Scanzia, who enjoy uninterrupted sunshine for forty days and darkness for an equal period each year (see also Fridtjof Nansen, In Northern Mists, New York, 1911, i, 130-134).

Place Names

585 *nouega*: = Norway.—586 *sechamor*: Scamor, CD; = Skanör (Hamy, 426).—587 *scarsa*: Scarsa, CD; = Skaraborg (Hamy, 383).—588 *zedina*: ?Andine, CD, which is possibly "nundinae," with reference to the fairs of Skanör and Valsterbode (Hamy, 385).—589 *selandia*: = ?Zealand, misplaced. See Nansen, Northern Mists, ii, 219.—590 *suzia*: Suecia, CD; = Sweden (Hamy, 383, 426).—591 *stochi*: Stocol, CD; Stocoll, CE; = Stockholm (Hamy, 386, 427).—592 *Erma*: ?Kalma, CD; = Kalmar (Hamy, 386, 427).—593 *sadezeftlingt*(?): Suderpigel, CD; Sudechping, CE; = Söderköping (Hamy, 387, 427).—594 *saglat*: Asillang, CE; Assingland on fourteenth century map in Museo Borbonico, Naples (Hamy, 427); = ?—595 *roder|in*: Roderin, CD; CE; = Roden, ancient name for the east coast of Sweden; = Rosladen (Hamy, 387, 427).

XXIII. EASTERN EUROPE

Mountains

596 *M^o. ripei*: Dupl. of 2.

Rivers

597 Leardo's unnamed river entering E extremity of Baltic is called Flum Nu on CD; Flum de Mi, CE; = Volkhof and Neva, confused (Hamy, 390).—598 *f. axiazes*: Axiaces Fl. of Sarmatia Europae, Ptol. (III, 5: 18 (FA9)).—599 *f. turllo*: Kretschmer (Port., 642) records Flumen Turle only on an anonymous fifteenth century map in the Museum für Meereskunde, Berlin (ibid., pp. 133-135); = Dniester (ibid., 642).

Edifices

(A) North of Neva

600 *zimachia Inferior*: ?corruption of Sarmatia, Ptol. (passim (FA9)). See also 12.—601 *rosia*: = Russia.

(B) Between Don, Neva, and Black Sea

602 *Lordo*, applying to a group of tents; = the Golden Horde of Tatars (Hallb., 318-319).—603 *nogard|ia*: Nogorado, CD; Nogorodo, CE; = Novgorod (Hamy, 390).—604 *alana*: Allania, CA; = the Alans (Hallb., 13-14).—605 *albana*: Albania, NW of Caspian Sea, Ptol. (V, 12 (FA18)); see Hallb., 14-15; = Shirvan and Daghestan (Besnier, 29).—606 *br . . ica*(?): Branchicha, CA; Brancica, Piz.; = Briansk (Hamy, 392).—607 *brachi|at*: ?Dupl. of 606.—608 *bthnia*: = ?Bothnia.—609 *rossia*: Dupl. of 601.—610 *transil|uana*: = Transylvania, misplaced.

Place Names

(A) Crimean Peninsula

611 *gotia*: = "A small stretch of land between the Yaila Range and the coast, in the hands of the Genoese after the fourteenth century" (Kret., Port., 643); see also Yule, Polo, ii, 492.—612 *soldaia*: = Sudak, important trading post in Genoese hands after 1365 (ibid., 644).—613 *gafa*: = Kafa, Feodosia (ibid.).—614 *soronti*(?): = ?—615 *uospe|ro*: = Kerch (ibid.).

(B) At Eastern End of the Baltic.

616 *piaha*(?): = ?Pinsk.—617 *letefa|n paga|n*: Litefanie Pagans, CA; = Lithuania (Hamy, 398-399).

(C) On Lake at Headwaters of Neva, Don, and Volga

618 *perana*: Perum, CA; CE = Murom (Hamy, 394).

XXIV. FAR NORTH

619 *DIXERTO DEXABITADO PER FREDO* (desert uninhabited because of cold): See 305.

LIST OF REFERENCES

LIST OF REFERENCES

The publications listed here are those to which frequent reference only is made in the Notes and Appendix. The abbreviations there employed precede each reference.

Besnier: Maurice Besnier, *Lexique de géographie ancienne*, Paris, 1914.

Buchon and Tastu: J. A. C. Buchon and J. Tastu, *Notice d'un atlas en langue catalane, manuscrit de l'an 1375, conservé parmi les manuscrits de la Bibliothèque Royale sous le N° 6816, fonds ancien, in-folio maximo*, in *Notices et extraits de manuscrits de la Bibliothèque du Roi et autres bibliothèques*, Vol. 14, Paris, 1841, pp. 1-152.

Only complete transcription and commentary on the Catalan Atlas. See CA.

CA: Catalan Atlas (i. e. map divided into six parchment sheets) of 1375; sometimes called Catalan Atlas of Charles V, to whose library it belonged. Facsimile in: *Choix de documents géographiques conservés à la Bibliothèque Nationale*, Paris, 1883.

See Kret., Port., pp. 123-124; Buchon and Tastu; Cordier, CA.

CD: Map of Angellino Dulcert, 1339. See E. T. Hamy, *La mappemonde d'Angellino Dulcert, de Majorque (1339)*, 2nd edition, Paris, 1903 (with photographic reproduction).

See Kret., Port., pp. 118-119.

CE: Catalan map of fifteenth century in Biblioteca Estense, Modena. Colored reproduction accompanying Konrad Kretschmer, *Die Katalanische Weltkarte der Biblioteca Estense zu Modena*, in *Zeitschr. Gesell. für Erdkunde zu Berlin*, Vol. 32, 1897, pp. 65-111, 191-218 (=Kret., CE). Photographic reproduction in F. L. Pullé, *Studi italiani di filologia indo-iranica*, Vol. 5, Atlas, Florence, 1905.

- Con.: *Libro del conocimiento de todos los reynos y tierras*
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THE REPRODUCTION OF THE LEARDO MAP

THE REPRODUCTION OF THE LEARDO MAP

By A. B. HOEN

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[One of the first things usually asked in regard to the reproduction or facsimile of an old map is: "How was it made?" To answer this question and to give some idea of the difficult technical problems involved, Mr. Hoen, under whose direction the Society's reproduction of the Leardo Map was made, has been kind enough to furnish the following note.—J. K. W.]

The Leardo Map is painted on parchment. Some of the colors have faded, and others here and there have separated from the skin, leaving blanks in the painting. The latter defects are especially noticeable in the yellow zones encircling the map proper. To avoid the injection of the personal element into the reproduction, no attempt was made to restore the missing letters or symbols. It is further to be noted that in cases of partial legibility the very palest parts of the faded manuscript may have failed to register in the reproduction, although great care was bestowed on this part of the work.

As a first step in the reproduction of the map, color separation negatives were made on photographic plates sensitized for all the colors. By interposing proper light filters and by making separate exposures for each color, negatives giving red, yellow or green, and blue or purple values were made, together with a fourth negative giving neutral tones—black and grays.

As the last negative comprehends almost the entire base of the map, special attention was devoted to its conversion into a printing plate. The process employed is known in Germany as "Albertype" or "Lichtdruck," in England as "collotype," and in America as "heliotype" or "photogelatin." Of these names, "collotype" seems to be the most fitting. Briefly, this process consists of sensitizing a gelatin film with a chromic salt and

exposing it to light under a negative. In proportion to the amount of light passing the negative there will be a reaction in the chromated gelatin. In this reaction the gelatin loses its power of absorbing water and takes on the opposite property of holding "non-watery" substances, such as printing ink. The action of the light is a graded one, varying from full effect under the clear parts of the negative to nil under the very dense parts. A similar gradation in ink-retaining powers is acquired by the exposed gelatin film. Thus, where the light exerts full effect the gelatin will be completely hardened and will hold the ink in its greatest intensity (solid); the parts which receive less light or none at all will hold the ink in attenuated quantity. The lights and shades of the monochrome picture are thus reproduced.

In order that the film may exercise this selective power of taking on or rejecting ink it is necessary that the unaltered parts be kept moist. Therefore, after exposure under the negative, the film is washed to free the gelatin of the unused chromates. While still moist it is rolled with a roller carrying printing ink. This roller will discharge its ink on the hardened parts of the film in proportion to the amount of light that each part has received through the negative. If a sheet of paper is then pressed on the inked film it will lift the ink and the resulting impression will be of the same character as the base color of the Leardo Map.

It is of interest to note that as the light-affected and hardened surface of the film accommodates itself to the unaffected underlying gelatin (as the latter swells in washing) it breaks up into a net of lines. This reticulation is barely perceptible in the high lights of the picture but gradually increases in strength until the mesh fuses into the solid color of the deepest shades.

It will now be apparent that the feasibility of printing these colloid plates hinges on the fact that the graded ink-attracting mesh is separated by inversely graded ink-repelling, interstitial, unaltered, and moist gelatin.

Its mesh not being apparent to the unaided eye, the colotype approaches the fidelity of a true photograph in the ren-

dering of details. For this reason, the collotype process has been selected as best suited for the reproduction of the Leardo base.

The coloring of the map was done by overprinting, in lithography, as many colors as were deemed necessary to convey a fair idea of the original. Lithographic plates were made from the color separation negatives mentioned above. The principles underlying the lithographic process are, broadly, similar to those described for gelatin printing, the essential elements in the process being a water-absorbing ground mass (limestone) in place of the gelatin and a water-repelling and ink-attracting surface affection similar to that created by the action of light on the chromated gelatin film.

Lithographic stone is an amorphous carbonate of lime of fine, close texture. It has an affinity for water—that is, it is easily kept damp. This affinity may be destroyed by changing the carbonate of lime to some water-resisting salt, such as the oleate, or by adding to the surface of the stone a film having the same power. Both of these methods were utilized in making the color plates of the Leardo Map.

A number of lithographic stones were properly surfaced and this surface covered with very thin, light-sensitive, colloid films. The color separation negatives were exposed over these sensitive films and the resulting photographs on stone gave the red, yellow, blue, and other values of the original as they had been analyzed by the light filters.

No color separation process, however, can eliminate from the areal coloring the black and grays of the base. Similarly, the colors themselves absorb a certain amount of white light so that the effect of the areal coloring is also felt in the monochrome reproduction of the base map (e. g., gray lettering is lost in heavily colored areas). For this reason, it is necessary to correct by hand the unnatural effect produced by the overprinting of all the color plates in the darker portions of the picture. Lithography is best suited for the control of these difficulties, and for this reason the color plates were made on stone.

The mechanical printing of the edition from gelatin or stone

embraces three essential operations: (1) moistening the plate by damping rollers; (2) inking the plate by inking rollers; (3) pressing of suitable paper on the inked plate. After the base is printed, the base plate is taken from the press, another plate, carrying one of the map colors, is placed in position, and the proper color put on the inking rollers. The printing of the second color is then done as was that of the base. Similar changes of the printing plates and colored inks follow in order for each of the colors which make up the complete map.

Eight color printings in addition to the base color were found necessary for the proper rendering of the Leardo painting. One of these, a light gray-buff, covers the area of the parchment and serves to bring it out from the white paper background.

In selecting a suitable paper for this reproduction, certain qualities had to be considered. Among these were good printing surface, durability, and as much strength as could be had along with the above essentials. A chart plate paper of high rag content was made especially for the work.

KEY MAPS

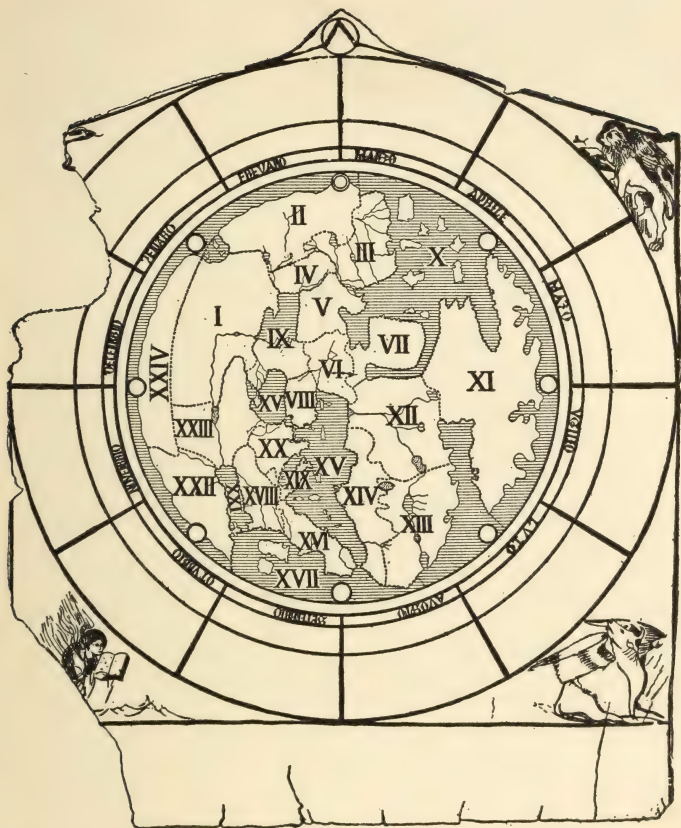


FIG. 4—General key map. The numbers correspond to those of the main center heads in the commentary on pp. 32-60.

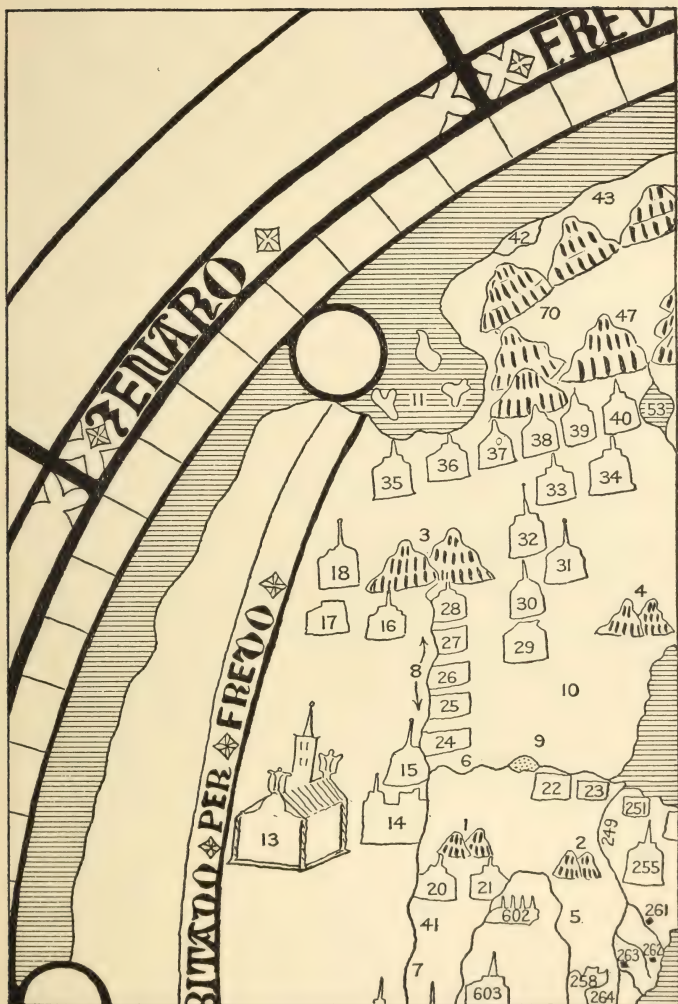


FIG. 5—Detailed key map: northeastern section. The numbers in this and in Figs. 6-9 correspond to the Arabic numbers on pp. 32-60.

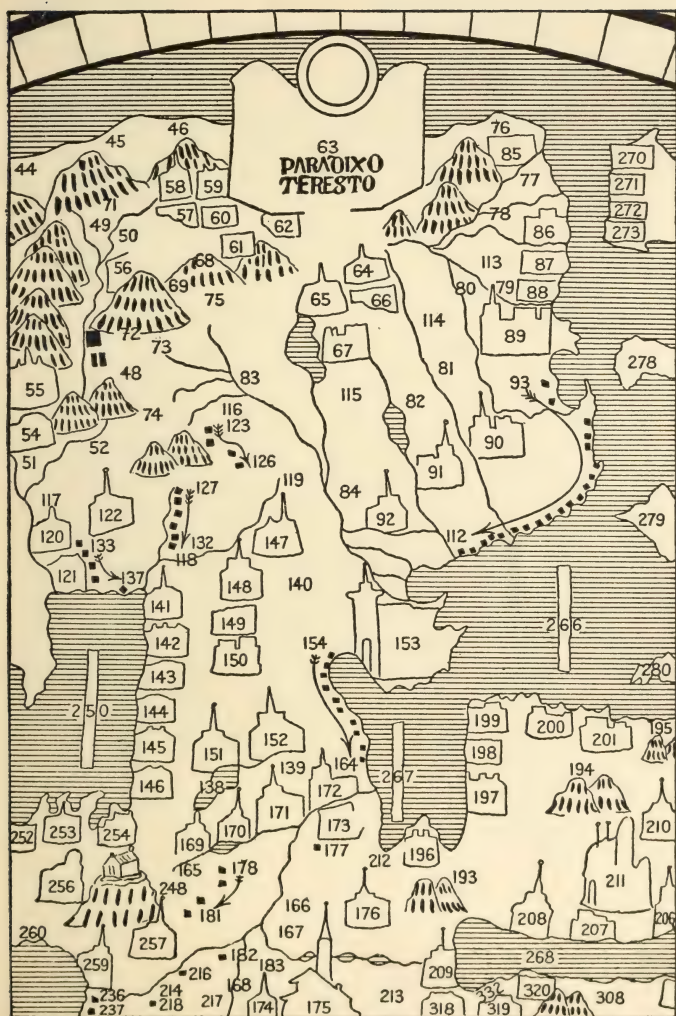


FIG. 6—Detailed key map: east-central section.

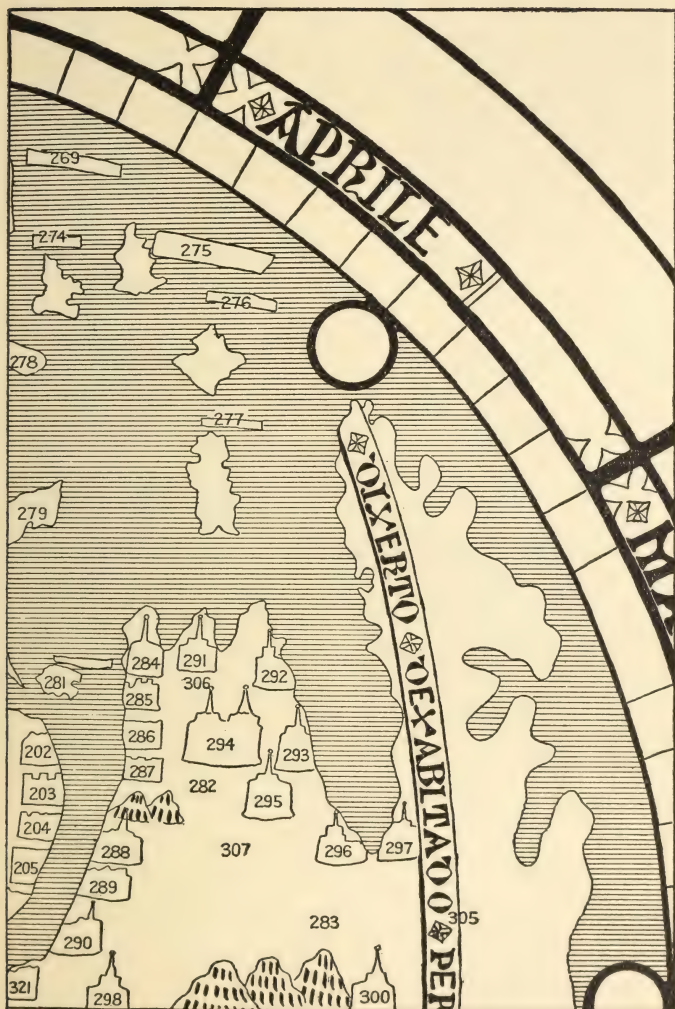


FIG. 7—Detailed key map: southeastern section.

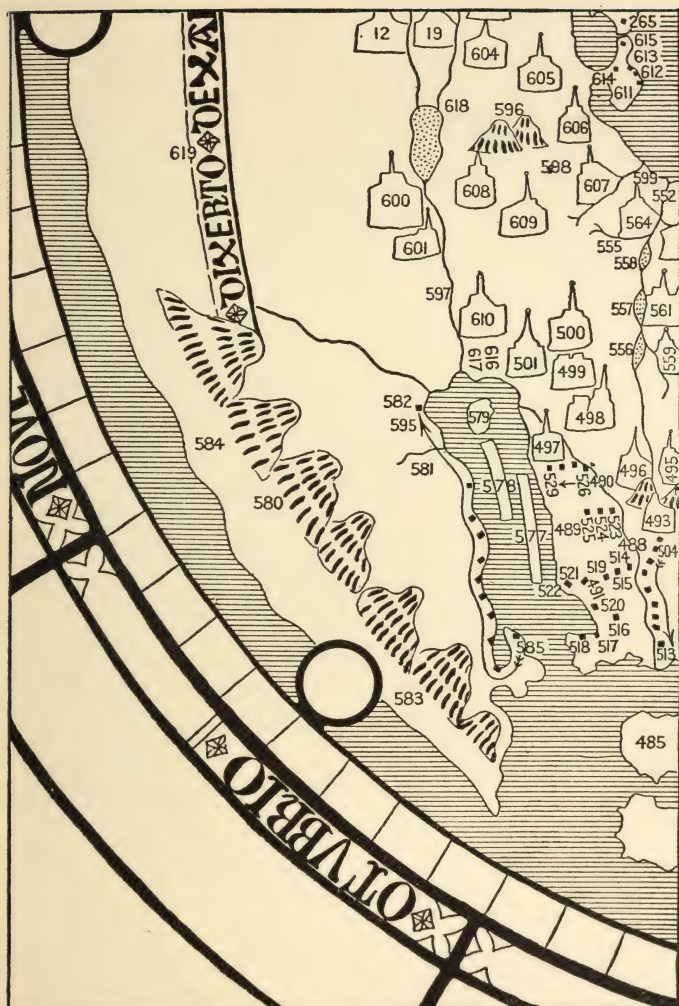


FIG. 8—Detailed key map: northwestern section.

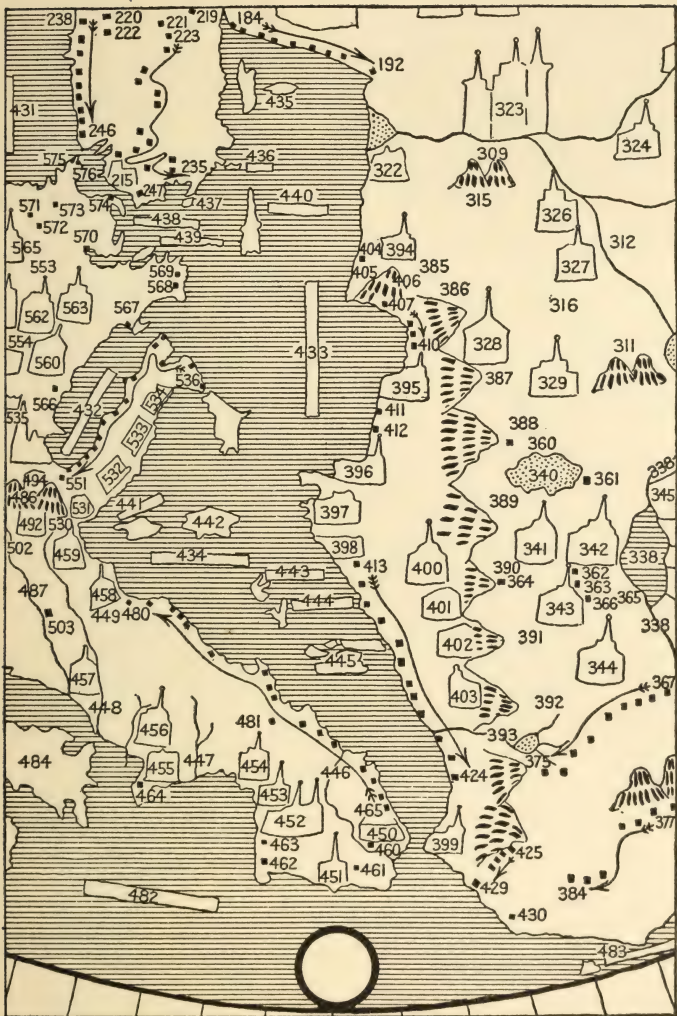


FIG. 9—Detailed key map: west-central section.

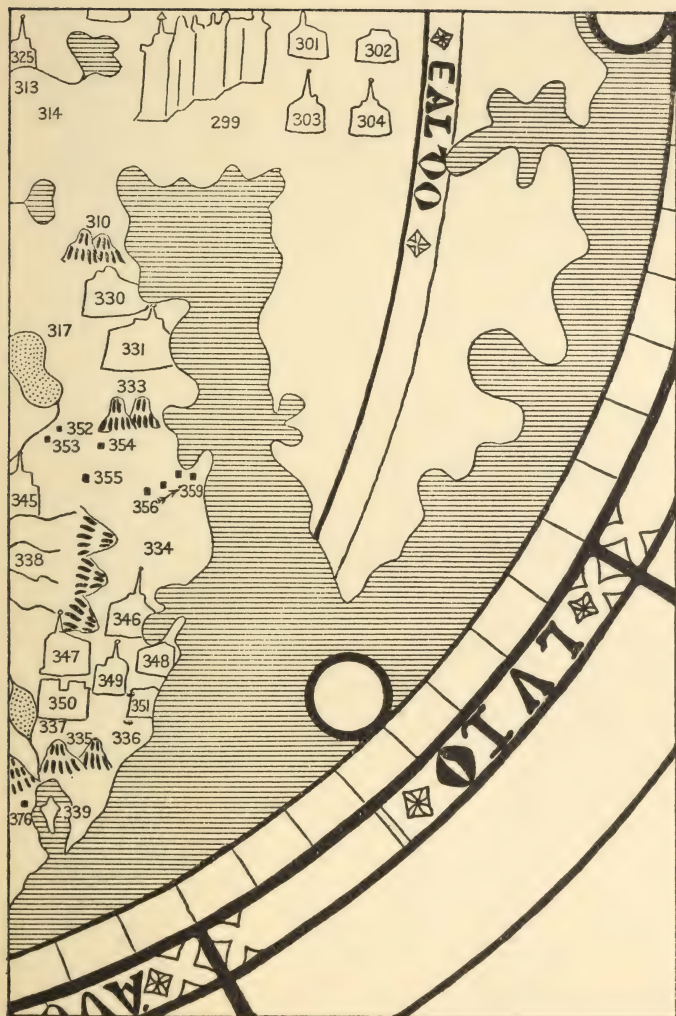


FIG. 10—Detailed key map: southwestern section.

Mapa mundi

